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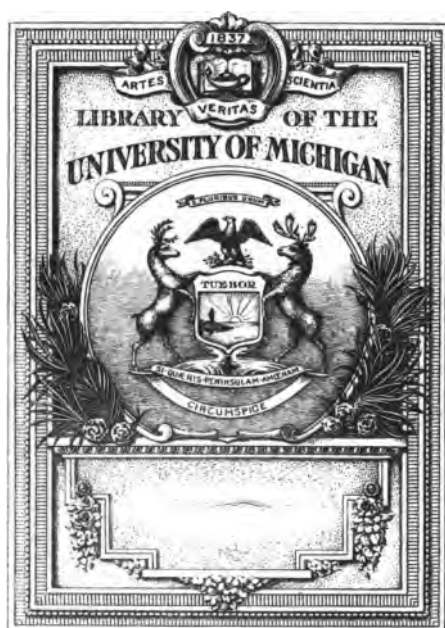
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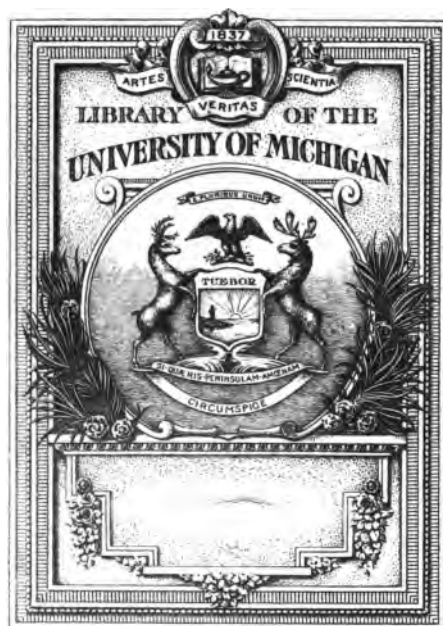


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THE
PHYTOLOGIST:
A
POPULAR
BOTANICAL MISCELLANY.

CONDUCTED BY
EDWARD NEWMAN.

VOLUME THE SECOND.
(CONTINUED).



LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.
M.DCCC.XL.VI.

126

Men of leisure, of all descriptions, residing in the country, could scarcely find a more delightful employment than in attempting to elucidate, from their own observations, the various branches of Natural History, *and in communicating them to others.*—BEWICK.

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P R E F A C E .

ANOTHER year has closed. Its botanical events have not been without interest: they have been faithfully chronicled in the pages of the 'Phytologist.'

The most prominent subject has been the failure of the potato: and unwilling as I have shown myself to become alarmist on this subject, I cannot shut my eyes to the consequences it has produced. The present deplorable state of Ireland appears mainly, if not entirely, attributable to this cause. What is wanted for that wretched country is not hypothesis, but food, and he who gives according to his ability, to save his wretched fellow-creatures from starvation, will surely reap the reward of an approving conscience. It is in vain for us to discuss problems either in politics or Natural History while the objects interested in the discussion are perishing around us.

The disease in question, although so greatly aggravated of late, is not of that recent date which has been generally imagined. When in the west of Ireland, in 1839, I found that the potato had almost entirely failed; many fields exhibited large, bare patches, where the haulm had disappeared, and in other places the haulm was blackened, the leaves presenting an appearance of being scorched or frost-bitten. In the vicinity of Waterford the crop, though not perhaps so abundant as in former years, was sufficient to allow a large export to the west. The price at Waterford was 3d. p stone of 14 lbs., while at Clifden it was 7½d., a difference which of course led to the export of large quantities. These remarks were printed at the time,

list of the species and varieties communicated to the Society since the publication of the 'Catalogue': these were seventeen in number, as a list of novelties it might still be considered incomplete, inasmuch as the Society had not then received various plants for which a claim to be considered British had previously been made. The subjoined list from the pages of the 'Phytologist' is somewhat more comprehensive and complete.

Teucrium Botrys, Phytol. i. 1086, discovered by Mr. Bennett, near Dorking, Surrey.

Leersia oryzoides, i. 1140, by Mr. Borrer, near Henfield, Sussex.

Spergula stricta, ii. 1, by Mr. Backhouse, &c., in Teesdale.

Galium Vaillantii, ii. 1, by Mr. G. S. Gibson, near Saffron Walden.

Saxifraga rotundifolia, ii. 3, by Miss Wright, at the foot of Causey Pike.

Œnanthe Lachenalii, ii. 13, by several botanists, in various and widely separated localities.

Carduus setosus, ii. 31, by Dr. Dewar, near Dunfermline, in Fifeshire.

Helianthemum Breweri, ii. 31, long since discovered on Holyhead Mountain by Mr. Brewer, but confounded with *H. guttatum* of authors.

Calamintha sylvatica, ii. 49, by Dr. Bromfield, in the Isle of Wight.

Cnicus oleraceus, ii. 53, by Dr. Bromfield, in the Isle of Wight, and ii. 115, by Mr. Cole, in Lincolnshire.

Rubus Babingtoni, ii. 138, by Dr. Bell Salter, at Selborne.

Hieracium nudicaule, ii. 184, by the late Mr. Edmondston, on the banks of the Findhorn, near Forres.

Rubus tenuis, ii. 192, by Dr. Bell Salter, in various localities.

Rubus Borreri, ii. 192, by Dr. Bell Salter, in various localities.

Orobanche amethystea, ii. 239, by the Rev. W. S. Hore, near Whitsand Bay.

Carex montana, ii. 289, by Mr. Mitten, near Tunbridge Wells.

Atriplex hortensis, ii. 330, by Dr. Bromfield, between Ryde and Binsted, in the Isle of Wight.

Carlina racemosa, ii. 413, by Mr. Andrews, in the Island of Arran.

Ranunculus Lenormandi, ii. 423, by Mr. Backhouse, near Coniston Lake: noticed as a species, by Mr. Babington, ii. 467.

Vaccinium macrocarpum, ii. 441, by Dr. Bidwell, in Soughton bog, near Flint.

Cerastium strictum, ii. 441, by Mr. Andrews, in the Island of Arran.

Cirsium setosum, ii. 441, by Dr. Dewar, in Scotland.

Glyceria plicata, ii. 444, by Mr. Moore, at Hampstead.

Cuscuta Trifolii, ii. 481, by Mr. Babington, &c., in various localities.

Cuscuta approximata, ii. 481, by Mr. Babington, &c., in various localities.

Agrimonia odorata, ii. 488.

Sisyrinchium anceps, ii. 500, in a wood, near Woodford, Co. Galway, Ireland.

Filago apiculata, ii. 575, by the Rev. Gerard Edwards Smith, near Doncaster.

Luzula nivea, ii. 575, by Dr. Dewar, near Broomhall, Fifeshire; a most interesting and unexpected discovery.

Orobanche lucorum, ii. 640, by Mr. Williamson, near Epsom, Surrey.

Achillea tanacetifolia, ii. 674, by Mr. Hardy, at Cromford Moor, near Maltock, Derbyshire: this plant is first recorded as *Achillea serrata*, but is subsequently correctly named by Mr. Notcutt, (Phytol. ii. 724).

It will be observed that the foregoing list contains plants that may be arranged under three heads; *first*, European old species newly discovered to be natives; *secondly*, exotic species introduced by accident or design, but not to be regarded as natives; and *thirdly*, new species created by the division of old ones. It is not my desire, nor do I consider it my duty, to analyze the list and place each plant under its respective head: let every botanist weigh the evidence before him and draw his own conclusions.

I have further to notice a list entitled "Some of the more recent and interesting additions to the British Flora," which has just been published in the 'Naturalist's Almanack' for 1847. In this meagre summary the author has omitted, either by design or through ignorance, the more important additions recorded in the 'Phytologist,' but has included the following names, to which I believe the pages of the 'Phytologist' have not alluded.

Sedum purpureum, (Tausch.) This is the well-known Sedum Telephium of British authors: the slight variety to which the name of purpureum has been given, is cultivated by Mr. Cameron in the Botanic Garden at Birmingham: I have known it for many years, and have no inclination to admit it as a species.

Valeriana sambucifolia, (Mikan). This was pronounced by De Candolle to be identical with our *Valeriana officinalis*, and I believe our best botanists coincide in this view.

Orobanche arenaria, (Bork.) This plant appears to be identical with *Orobanche cærulea* of British authors.

Linaria supina, (Desf.) A species introduced with foreign grain.

Carex Persoonii, (Sieber). A name only, as regards this country, and erroneously applied to a dwarf form of *Carex curta* found in the Highlands of Scotland.

Besides these, *Carex Grahmi* (Boott), appears in the list. This plant has been known for so many years that it can scarcely be recorded as a novelty, although Dr. Boott has only given it a name within the last five. (See Phytol. i. 910). It was formerly held to be a large variety of *C. pulla* or *C. saxatilis*; but it will be seen by a reference to the 'Phytologist,' that it has there been accepted as a species, on the authority of Dr. Boott, whose acquaintance with the genus is I believe unrivalled.

Professor Lindley's admirable work, the 'Vegetable Kingdom' gives a lustre to the year in which it was published. It is by far the most valuable contribution to botanical science that this country has pro-

duced ; and will at once take precedence of all our other publications on the same subject ; nay, more than this, it will occupy in Botany the same ground that the lamented Cuvier made so completely his own in the sister science of Zoology. This great work has furnished me with the means of testing the applicability of my views of System to the Vegetable Kingdom : and there appears to be no shadow of doubt, but that, with the kind and active assistance of Mr. Luxford, I shall be able to deduce irresistible evidence of their truth, from a source to which I had never previously looked for support.

I am not, however, so sanguine as to hope any speedy or general adoption of my views, however clearly they may be set forth,—however irresistible the evidence may appear to the candid enquirer. There is a scientific power in this country far above the reach of truth,—a power which refuses to acknowledge the worth of all that does not emanate from itself. It is the bane of science ; the great stumbling block in the student's path ; the bitter blast that wraps energy, genius, and originality in its icy embrace. But for this scientific power, this patronising authority, this chilly influence, this machinery of mental conservatism, we should have taken the same lead in science which has been ours in other matters : we should have long since possessed our 'Vegetable Kingdom' : and the 'Animal Kingdom' too might also have been ours ! Aye ! more than this, we should have lately had the surpassing honor of calculating a planet into existence. But alas ! how few in this country pause to enquire into worth or truth. The only query is whether the author belongs to the clique that arrogates to itself the privilege of dispensing scientific reputation. While this intolerant spirit exists, the energetic labourer has only to persevere ; and let him regard the 'Vegetable Kingdom' as a bright example of the success attending perseverance : throughout his warfare Mr. Lindley has stood alone : he owes nothing but opposition to the Fadladeens of Science.

In our endeavours to trace the existence of a System in the Vegetable Kingdom, it becomes necessary to institute a rigid comparison between the results obtainable in both. It seems to be a postulate of the true System that a natural group resolves itself into four others,

whereof one shall be normal or typical, *i. e.* possessing the attributes of the group in the highest degrees, while the remaining three are discrepant among themselves, abnormal as regards the whole, and double as regards their composition, each dividing into two, and these halves being again divisible by four. In order, therefore, to pursue the enquiry, we must successfully show that the exogens naturally divide into four minor groups, whereof one is typical and exhibits the perfection of exogenous structure, and this typical group of exogens must again submit to a quaternary division, and so must we pursue the subject until we finally place a single species on the central throne of the vegetable kingdom, with the same certainty we feel in assigning to man the same unquestionable superiority in the animal. The time will come when this enquiry will be pushed forward with a vigour and assiduity equal to that lately displayed in fixing on a central sun; and the time will also arrive, sooner or later, when the interest felt in the enquiry will be at least as great. The postulates of a central tree may be difficult to define; and in this, as in all questions of the kind, we must carefully weigh the evidence on every side, and we must ever pay the most profound respect to those opinions of botanists which have been expressed irrespective of any intention to advocate particular systems: in this matter Mr. Lindley is a safe and able guide.

I find that an opinion prevails with some of the contributors to the 'Phytologist' that details of botanical rambles, &c. are not acceptable: this opinion is erroneous; some of the best papers in the magazine may be classed under this head. An objection has certainly been made to the introduction of puerilities and worn-out truisms into these communications; but I have never received the slightest criticism on papers, the object of which was to detail botanical facts or observations. It would of course be a most ungracious task to point out papers, or parts of papers, which swerve from the path of instruction and utility, but it is a pleasant one to call attention to a communication which may serve as a model for this kind of writing: I allude to that by the Rev. W. S. Hore, entitled "A day's botanizing on the

Lizard," (Phytol. ii. 235). In this communication there is scarcely an irrelevant word, and certainly no sentence of any length that does not leave the reader impressed with some fact or suggestion worthy of being remembered. There are many papers of the same kind to which I might invite attention, but this strikes me as the best example of what the record of a 'botanical ramble' ought to be: everything worthy of publication should be published; everything trite, or common-place, or puerile, or personal, suppressed. Were these observations kept in view, I feel confident that no one would ever dissent from the opinion, that the record of a botanical ramble is both agreeable and useful. I am the more anxious to reiterate this statement, which has already appeared on the wrapper of a monthly number, from the circumstance that the dissemination of the opinion above alluded to, has had the effect of deterring several contributors from sending their observations, under the fear that these might not appear of sufficient scientific value in the eyes of the Editor; and thus, as I am led to believe, the 'Phytologist' has been deprived of many interesting and instructive papers which would otherwise have adorned its pages: and let me remind my correspondents that this is not the only loss, for in consequence of this defalcation, the quantity of matter in each monthly number has decreased, a circumstance fully as much at variance with my wishes as with those of the kind subscribers who have supported the work from its commencement.

EDWARD NEWMAN.

9, Devonshire Street, Bishopsgate,
Dec. 26th, 1846.

ADVERTISEMENT.

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THE PHYTOLOGIST.

Botanical Notes for 1845. By GEORGE STACEY GIBSON, Esq.

THE following notes made during last summer, unconnected as they are, and put down at the time with no intention of publication, I have since thought contain a few facts which may prove interesting to some of the readers of the 'Phytologist,' and therefore I shall make no apology for sending them, in their present form, for insertion.

Helmsley is a pleasant little town situated about twenty miles from York; near it, is Duncombe Park, the seat of Lord Feversham, the scenery of which is peculiarly diversified and beautiful, and the general aspect of the country is one of much interest to the lover of Nature. There are several ruins around, among which Rievaulx Abbey stands pre-eminent. The views near this fine edifice are very imposing, and situated as it is, like many similar ones, in a rich valley, with the hills rising around in the form of an amphitheatre, their sides copiously clothed with the foliage of extensive woods, this must be considered one of the most striking ruins remaining in the country. The celebrated Kirkdale cave, in which so many bones of hyænas and other animals, extinct in this country, were discovered some years ago, is also situated in this neighbourhood; there is little now to be seen in it, and I believe it is closed.

Near Helmsley was formerly a well-known locality for *Cypripedium Calceolus*, and when there I took some pains to make inquiry respecting it, and had the weather permitted, fully intended to have explored the locality myself. This is in a woody glen, about three miles from the town, near the rise of a small stream which runs through it. Some years ago it grew there rather plentifully, but from the rapacity of some individuals it has been nearly exterminated, and last year only one plant of it was seen. This year the place had not been much searched, but none had then been found, so that in a few years at least, we may expect this beautiful native of our northern woods will be quite eradicated in another of its few remaining localities, which is the more to be regretted, as it arises, in great measure, from that selfish desire which cannot be too strongly deprecated, on the

part of some botanists to possess themselves of every specimen within their reach, regardless alike of those who may come after them, and of the preservation of the plant. This practice, if carried on, as it has been of late years, will soon have the same effect on others of the rarities which now ornament our fields and woods, as it has already had on this, and some others of our most interesting plants.

The importance attached to having specimens with the root, very much increases this danger; and unless persons can be sufficiently disinterested sometimes to dispense with a perfect specimen, rather than injure the locality of the plant, it argues very strongly of the selfishness which is too often apparent, even among professed lovers of Nature, whether in an individual or collective character; *professed*, I must call them, as their love appears rather to attach to the possession of a complete collection, than to Nature herself. But I return from this digression into which the subject has led me, and which I feel to be a caution specially needed at the present time.

Another locality of *Cypripedium* was near Rievaulx Abbey, but it does not appear to have been seen there for many years. The woods, however, still present some choice rarities, among which may be noticed *Epipactis ensifolia*, which grows plentifully, also *Ophrys apifera* and *muscifera*, one or two *Pyrolas*, &c. The old man who has care of the terrace is very particular about some of these plants, placing sticks by them, &c. and was at first rather angry at my gathering one, but finding it was not done, as often is the case with visitors, carelessly, just to be looked at and thrown away, he became very civil, pointed out several plants of which he wished to know the names, and allowed me to collect as many as I desired.

Near the ancient town of Richmond, I have simply to notice, that on the remains of some of its numerous relics of antiquity, and especially on the massive walls of its castle, *Linaria Cymbalaria* was growing abundantly in situations where it was very unlikely to have been planted by the hand of man; this could not but lead to the conclusion, that although in many localities it is only naturalized, yet that it may really be a native of this country, and I think observation upon it here, would lead others to a similar opinion, while there requires care not to be hasty in admitting doubtful plants into our Flora, as has been very much the case lately, and even those not naturalized; perhaps, on the other hand we should not be too ready to consider any plant merely naturalized, because it is so in some places.

In a wood near Cotherstone, I gathered *Pyrola minor* abundantly; and in spending a few hours at the High Force, in Teesdale, the

scene of our interesting rambles the previous summer, I noticed several of the *Hieracia* in flower. This is probably the richest district in England for this tribe of plants, and a further examination of their different forms here, would probably lead to this difficult genus being better understood. Among them, besides the common ones, were *H. rigidum*, *Lawsoni*, *Lapeyrousii*, &c.

Though the two last-named species sometimes rather resemble each other, I cannot at all doubt the permanence of their specific differences. They grow near together, and in similar situations, yet still preserve their characters, and these are even more strongly developed by cultivation, as has been proved by my friend James Backhouse, of York, who has had plants of them in his garden for a considerable time. The grass recently called *Poa Parnellii* was in full perfection, but I feel fully persuaded that it is merely a variety of *P. nemoralis*. *Equisetum umbrosum* was growing abundantly near Winch Bridge, but I am informed that the fertile stems were very scarce in the spring. Its peculiar habit renders it easily distinguishable from any other species. I had no opportunity to visit the locality of *Alsine uliginosa*, neither have I heard that any one has done so during the summer, but had rather hoped that it might have been discovered in some new situation. *Woodsia ilvensis* was gathered from one of the plants we noticed last year, on the upper ridge of rocks at Falcon Clints.

But I must leave this interesting locality and proceed.

On the banks of Ulleswater, near Pooley Bridge, grows, *Ranunculus Flammula*, *β. reptans*, presenting an appearance materially different from the usual form of *Flammula*, so as to give some reason for supposing it a distinct species, but this seems to consist chiefly in the very small size of the plant, especially of the flower. Near Stock Gill Force, a picturesque waterfall at Ambleside, is a good locality. *Impatiens Noli-me-tangere* has long been known to grow there, and it is still found abundantly, apparently wild, though it is difficult to tell when plants so easily propagated may have been introduced. It grows on the steep sides of the Gill, both above and below the path near the mill. In the same woody glen I gathered *Festuca Calamaria*, *Polypodium Phegopteris*, *Dryopteris*, &c. *Hymenophyllum Wilsoni* is also found there, as well as near several other waterfalls among the lakes, as Scale Force, Lodore, and clothing the sides of the steep rocks at the curious fall of Dungeon Gill, which is embosomed in the romantic valley of Great Langdale.

At Keswick my information is chiefly borrowed, but I give it, because it may stimulate botanists more fully to explore that rich neigh-

bourhood, which could scarcely fail to repay a diligent search, and thereby probably might be brought to light some hitherto hidden treasures, really natives of our island, and not naturalized exotics. Besides this, the traveller would be amply rewarded for any toil, by the sight of such magnificent scenery as there abounds on every hand, and often most interesting where least visited by the rude hand of man.

There is a person at Keswick, named Wright, who has a good collection of plants, and considerable acquaintance with the localities of them, having employed herself in collecting specimens for sale, &c., and having visited many of the neighbouring places in company with botanists who have occasionally been in that part. Any one would be repaid by making her a call, as she speaks from personal observation and knowledge. She, as well as her father, who acts as a guide to strangers, has explored many of the recesses of the mountains, in which several rare species have been found. Among these may be noticed *Geranium nodosum*, gathered a few years ago near Leathes Water pretty plentifully, but now, in consequence of the land having been cultivated, it is supposed to have disappeared from that spot, though probably it still grows in some adjacent situations.

Geranium striatum is found on the coast, near Flimby, Cumberland, plentifully, and apparently wild. *Rosa gracilis* on the road-side passing over Whinlatter towards Lorton.

Rosa cinnamomea? In Howrey field, Keswick. This is so named by Wright, and if one can judge by dried specimens, greatly resembles that species, which has usually been considered to have such slender claims to be a native. I hope this plant will be examined by botanists more carefully in this spot, as it deserves attention.

Lysimachia ciliata, which was first noticed by W. Backhouse, between Penrith and Wigton, has been discovered in a fresh locality at the foot of Warnel Fell, Cumberland, a wild situation, thus leaving no reasonable doubt of its being a native plant. *Saxifraga rotundifolia*, too, was found a few years ago among the rocks in the vale of Newlands, but has since been searched for in vain. *Alchemilla alpina* grows abundantly in Gatesgarth Pass, and sometimes approaches so near to the form called *conjuncta*, that I much doubt their being permanently distinct.

Rumex alpinus was found sparingly on one of the mountains near Keswick.

Cypripedium Calceolus formerly grew in Legberthwaite, but is now thought to be extinct there.

Juncus filiformis still grows plentifully in a meadow between the town and the lake at Keswick. *Asarum europæum* is found in small quantities in Troutbeck. *Meum athamanticum*, scarce near Keswick; *Hieracium aurantiacum*, vale of Newlands; *Euphorbia Cyparissias*, in Ulpha; *Meconopsis cambrica* and *Spiræa salicifolia* between Hawkshead and the Ferry; *Lobelia Dortmanna* grows in most of the lakes; *Atropa Belladonna* at Furness Abbey and Arnside Tower. Also *Pyrola secunda*, *Listera Nidus-avis* and *Oxyria reniformis*, near Keswick.

Specimens of all the plants above enumerated were shown to me, from their respective localities, except *Cypripedium*.

Before concluding, I may just say, that *Galium Vaillantii* has reappeared in this neighbourhood, and in several situations where it was not noticed last year, so that I cannot doubt that it will be found in other places, having been mistaken for *G. Aparine*, from which I believe it is now generally allowed to be distinct. The differences between the two plants, as pointed out in a former communication, are clear, and proved to be permanent by cultivation, which only renders them more striking. I shall be glad to supply any botanical friends with a specimen of this interesting addition to our British Flora, as far as my stock will allow, and doubt not that another season any deficiency can be made up. I hope, too, that throughout the country botanists will search for it, and quite expect they will be rewarded by the discovery of it in many other places.

GEORGE STACEY GIBSON.

Saffron Walden.

Remarks on Mr. Watson's Report of an Experiment which bears on the specific identity of the Cowslip and Primrose, (Phytol. ii. 217). By EDWARD S. WILSON, Esq.

As no one else seems inclined to take up the subject of Mr. Watson's experiment, I venture to suggest an explanation, which, though merely hypothetical, may possibly prove to be the true one.

It appears to me that the whole question may be resolved into these two :—

- 1.—Does the vegetable hybrid possess the power of reproduction ?
- 2.—If so, was the plant of which the seeds were sown by Mr. Watson, a hybrid ?

If these two questions can be answered in the affirmative, I do not see that the results of Mr. Watson's experiment are in any way inconsistent with the received law of species.

1.—As to the fertility of the vegetable hybrid, I confess that I am ignorant of any facts bearing upon the subject, but some of your correspondents will, no doubt, be better informed.

2.—The plant sown by Mr. Watson is said to have been *P. intermedia* of the 'London Catalogue.' I cannot certainly say that this plant has fallen under my own observation; but there is an oxlip, of no unfrequent occurrence in the cowslip-fields of this neighbourhood, to which I have always attached the name of "*intermedia*," from its significance. It is found either with or without a scape, or with both forms of inflorescence proceeding from the same root. In the form and pubescence of its calyx, the colour and expanse of its corolla, the shape of its leaves and the odour of its flowers, it is exactly half-way, so to speak, between the primrose and the cowslip. It grows near the margin of the field, where there are primroses on the hedge-bank. That this plant is a hybrid, I have scarcely any doubt, but whether it is identical with the subject of Mr. Watson's experiment, remains to be seen.

Supposing it granted, however, that Mr. Watson's plant was really a hybrid, and of course a fertile hybrid, we have to consider next, what would be its law of reproduction. And here we must recollect that a hybrid is not a species, nor is it, properly speaking, a variety of any one species. It is a variety compounded of two species, from neither of which is it separated by more than the usual range of variation. Now, if we were to speculate, *à priori*, on the probable offspring of such a being (having respect to the two grand laws of generation,—that like produces like, within certain limits,— and that varieties tend to revert to their original types; assuming also that the parental influence might be unequally distributed through the reproductive system of the hybrid), should we not say that it would consist of precisely such a series of forms as that obtained by Mr. Watson? The case seems to me analogous to that of a large family of children, where one child may be a copy of the father, a second of the mother, while the rest may exhibit various degrees of resemblance to both parents. I am aware that the two cases are not exactly parallel, but the analogy between them is sufficiently strong for the purpose of illustration.

Now I admit that all this is purely hypothetical. Still, if it be not contradicted by facts, I think it may fairly be weighed against other hypotheses of a more startling and improbable aspect. If, indeed,

Mr. Watson had succeeded (and I am far from asserting that he may not) in raising the primrose from the seed of the cowslip, or the cowslip from the seed of the primrose, we should then have been driven to the adoption of one or the other of his two alternatives: *to wit*, either that one species may generate another, or that the primrose and the cowslip are of one and the same species: the former implying that there is no such thing as species, in the strict sense of the term; the latter, that if there is such a thing as species, no assignable amount of outward character will suffice for its determination. But if it only appears that two distinct species have been elicited from the mongrel form which contained them both, I do not see that we are under any such compulsion.

Perhaps I may be allowed, in conclusion, to express my surprise that such experiments as that of Mr. Watson are not more frequent among those who have time and opportunity for the purpose. Sure I am, that the conductors of such experiments are entitled to the gratitude of all true botanists. For, without depreciating the labours of those who are engaged in the demonstration of external differences, we must admit that those labours will be greatly assisted by a frequent reference to the test of reproduction.

EDWARD S. WILSON.

Buglawton, Congleton,
November 19, 1845.

Remarks on the usefulness of a Periodical devoted to British Botany; suggested by the 'Transactions of the Botanical Society of Edinburgh.' By HEWETT C. WATSON, Esq.

PERHAPS the editor of the 'Phytologist' will allow me to call the attention of its readers to the just-published parts of the 'Transactions of the Botanical Society of Edinburgh;' and in connexion therewith, to suggest a remedy for a disadvantage which must have been felt by all who are interested in the progress of British Botany. The first and second parts of the second volume of those "Transactions," I believe, have only just come out. They are thus described in an advertisement circulated by post:

"These parts, which occupy 174 pages of letter-press, with no fewer than nineteen plates, contain many valuable papers on botanical subjects, selected from those read before the Society during the years 1843 and 1844; and the committee feel assured that they will be found well calculated to promote the Society's reputation as a scientific body."

In a general sense, the truth of this advertisement may be admitted, although some rather important part of the truth is suppressed. The Transactions do include papers of botanical value; and taken in the aggregate, the "papers" are such as deserve the eulogy pronounced upon them by the committee. But it does not so surely follow that "the Society's reputation as a scientific body" will be much promoted by the republication, in 1845, of papers read before the Society in 1843 and 1844, and then printed as articles in a periodical. I cannot help thinking, that the republication of articles from old Nos. of a periodical, *without change or correction*, under the name of "Transactions," is not very creditable to a scientific society. To say nothing of their being, as they must of course be, only such a selection from the real Transactions as the individual editor of a periodical had thought fit to print in his journal. And moreover, taking into account the post-date (1845) of the republication, the act looks very like wilful injustice to other botanists, and an obstacle in the progress of science.

It is unjust to other botanists by its silent neglect of those works, in which more accurate elucidations of the same subjects had been published, *between* the original date of the articles and the post-date of their republication under the imposing name of "Transactions."

It becomes also an obstacle in the progress of science, because it lays before botanists the earlier and less accurate, in place of the later and more accurate, knowledge on the subjects treated, and that, too, with all the impress and influence which the name of a scientific society can give. In this way it is eminently calculated to mislead those who have not the leisure for collation and comparison of facts and dates in different periodicals; or, it may be, not the means or inclination to purchase all the works which would be required for the purpose of amending the false impressions conveyed to them.

That this is not mere conjecture, but a positive fact, may easily be shown by an example from the "Transactions." In plate IX. we have some good representations of the leaves of "Robertsonian Saxifrages." The plate is intended to illustrate a paper from the pen of Mr. Babington, entitled, "On the difference between the Robertsonian Saxifrages of Ireland and those of the Pyrenees." The sole purport of this eminent botanist's paper, is to state that the leaves of the Pyrenean Saxifrages (*Sax. hirsuta*, *Sax. Geum*, *Sax. umbrosa*), all differ in rather a remarkable manner from those of the Irish examples of the same species: namely, in the leaves of the Pyrenean plants being "crenate," while those of the Irish plants are "acutely crenate," "serrate," or "dentate." If this really had been a fact, it would have been a cu-

rious circumstance to account for. But it so happens that the statements in Mr. Babington's paper are quite erroneous. Some time back Mr. Andrews directed my attention to the true state of the case, and obligingly supplied me with Irish plants, which afforded the most unequivocal contradiction of Mr. Babington's (supposed) fact. Specimens in proof of this were laid before a meeting of the Botanical Society of London, in June, 1844; and the circumstance was explicitly recorded in the 'Phytologist' of the next month, July, 1844. Moreover, I feel assured that Mr. Babington would not deny his own knowledge (or belief) of his supposition being untenable. Notwithstanding this, however, the untenable supposition is republished, a year after, as though it were still an unquestioned fact!

This is not the only example of its kind which could be adduced from the 'Transactions' before me. But one example will suffice whereon to found two questions, which may be answered by the "committee," or for them by the readers of the 'Phytologist.' 1st.—Is it conducive to the progress of science, that a statement should be republished, without correction or qualification, after it had been proved totally inaccurate? 2ndly.—Is it justice to that botanist, by whose superior knowledge and more careful observation of Irish plants the mistake was corrected, that readers of a work published in 1845 should be thus kept in ignorance of the correction made in 1844?

It appears to my judgment, that a postscript was necessary to the *post-dated* republication, in order to contradict or qualify any statements therein, which, at the date of republication were known to be inaccurate. To republish statements, known to be erroneous, seems very little better than wilful mis-statement: there is suppression of truth, with statements that are not true.

The case selected is a decided one. Mr. Babington's knowledge of British plants, and his general accuracy of observation, are unquestionable. And yet even this eminent botanist's own papers render the republished "Transactions" thus liable to objection. Much more so may they become, in the case of other contributors less conversant with British Botany. In prosecuting scientific inquiries, any of us may commit occasional mistakes, and I have committed too many errors myself, to find fault with other parties simply on account of a mistake. I beg therefore, to repeat, that no censure is here directed towards the error itself, but simply against the *republication of statements without correction, although known to be erroneous.*

The preceding instance shows one bad effect which can hardly fail to result from the peculiar mode of publication adopted by the Com-

mittee of the Edinburgh Society. I have next to mention another disadvantage which is strongly felt by many of those botanists who wish to keep up their knowledge of anything done or discovered in British Botany. Papers on this subject are sent to the Edinburgh Society. They are transmitted thence for insertion in the 'Annals of Natural History,' provided, I may presume, they chance to meet the approbation of the part-editor of that periodical who looks to the botanical department. Readers who desire to see these botanical papers, must therefor procure the 'Annals,' the cost of which is thirty shillings a year. Doubtless that is a well-conducted and valuable periodical, but the larger part of it being devoted to other subjects than Botany, any one who buys it for papers on British Botany, transmitted from the Edinburgh Society, must pay about six times the actual value of its botanical pages. Should a botanist decline to pay this high price, he may procure the same pages, two or three years, after, under the name of 'Transactions,' that is, the periodical articles of 1843 and 1844, may be bought collected as 'Transactions,' in 1845, — when their novelty is no more, and much of their interest or usefulness has evaporated under the rays of improved knowledge.

It is not alone in the Annals, that papers on British Botany are lost to many botanical eyes, through being dispersed amid a large quantity of more miscellaneous matter. Such papers are occasionally sent by their authors direct to other similarly comprehensive periodicals; the general result being, that we, residents in the country, must expend many pounds annually, before we can feel assured that all the current contributions to British Botany are likely to come under our eyes. I consider and feel this to be a great disadvantage. As a class, botanists are not those men of wealth and leisure, to whom money and time are, as the saying runs, "no object." On the contrary, I take it, that most of those who feel really interested in the progress of British Botany, would like well enough to find some one periodical becoming, as nearly as possible, a complete record and index of all that is done or discovered in British Botany, and which would still be brought within the reach of purses lightly filled.

To accomplish this, the periodical must be devoted exclusively to the Botany of the British Isles. It must be published at a moderate price; and the editor must himself take some pains to render it complete, as far as the progress of British Botany is concerned. On the other side, English botanists should send thereto as many of their contributions as they could compress into a moderate space; abstracts of all such papers as they might prefer to print in the larger

periodicals, being likewise still communicated to the one for British Botany, by their respective authors.

A periodical on this plan would of course be read by all British Botanists; and it would be kept on their book-shelves, as an indispensable book of reference, a dictionary and history of the progress of British Botany. The proprietor would be benefitted by the larger circulation; the purchaser would find his account in the completeness and cheapness of the information conveyed in it; and the contributors would know that any useful information which they had to give, would be pretty sure of meeting the eyes of those for whom it was written; and that, by no other channel could they so well insure this important object.

The next point is, where to find the periodical; and fortunately this appears within compass. We have now two monthly periodicals devoted wholly to Botany. The "London Journal of Botany" has not many articles on exclusively British Botany, though it affords excellent means for circulating papers of wider general interest through the botanical world. The 'Phytologist,' on the other hand, is almost limited to British Botany, and might become quite so;—it is published at a small price—it does already receive the chief portion of the most interesting papers on British Botany, and though not hitherto the *complete* record and index suggested, it goes already so far towards that desirable object, as to bring within prospect the possibility and likelihood of its attainment. The additional space would be gained by the easy and required process of pruning down those exuberant articles, whose purpose is little more than to say over again matters previously on record and sufficiently well understood. There are perhaps few papers, even those of the poorest contributions among the "rambles" and "visits" which do not include some facts or suggestions which might be worthy of record, if cleared out from the bushel of chaff within which the grains are hidden and lost. The space so saved would be ready for the abstracts and references, and notices of articles elsewhere printed, which are indispensable for making the 'Phytologist' that full and complete register of British Botany now so much needed.

HEWETT C. WATSON.

Thames Ditton,
24 November, 1845.

List of Mosses found near Chelmsford. By A. GREENWOOD, Esq.

I AM induced to offer the following list of mosses to the readers of the 'Phytologist,' from the belief that no account of the cryptogamic productions of the immediate vicinity of Chelmsford has yet appeared in publication.

The species mentioned, which all grow within the distance of about ten miles from the town, amount to 109; and when it is considered that they are the result of the investigations of the last winter only, and of my own individual exertions, we may suppose that many must necessarily have been overlooked. In the genera *Dryum*, *Orthotrichum* and *Sphagnum* particularly, I think there must be a deficiency in the number of species, but as it is my intention to leave home shortly, I prefer sending the list as it is, to waiting an indefinite time for an opportunity of adding to it. Doubtless, also, the majority of those to which stations are given, grow in many other places as well. I merely state where I myself have found them. At the advice of some of my friends, I have adhered, where possible, to the nomenclature of Hooker and Taylor, as being that at present in most general use among botanists.

To the kindness of Mr. G. H. K. Thwaites, of Bristol, I am indebted for confirmation in the names of some of the species.

Phascum crispum. Banks, &c., rather common.

—— *subulatum.*

—— *muticum.* I have only observed it at Queen's Wood, Great Leighs, but it is probably common.

—— *cuspidatum.*

—— *curvicollum.* A few single plants gathered in several places.

Sphagnum obtusifolium.

—— *acutifolium*

—— *contortum*, Schultz, B*. I believe this is not uncommon in company with other *Sphagna*. I have gathered it on Woodham Walter Common, and on Warley Common, near Brentwood.

Gymnostomum viridissimum, B. On a tree in Bligh's Wood, Springfield; also on a tree in the parish of Roxwell.

—— *truncatulum.*

—— *conicum.* On clayey fallows, &c.: not uncommon.

*B, not yet discovered in fruit.

Gymnostomum fasciculare. (Not of Hooker and Taylor: *Physcomitrium fasciculare*, Br. and Sch.). I believe I have observed this in several places, but neglected to gather good specimens at the proper time.

——— *pyriforme*.

Tetraphis pellucida. Abundant on shaded ditch-sides in the neighbourhood of Woodham Walter Common; also in a little wood near Galleywood Common.

Weissia lanceolata. On a clay bank upon Little Boynton Hall Farm, Roxwell.

——— *cirrata*. Common on posts and rails.

——— *curvirostra*. On a tree by the side of Blackwall chase, opposite the Hare and Hounds Inn, Roxwell.

——— *controversa*.

Grimmia apocarpa. Not very common; I have gathered it on stones in Boreham and Danbury church-yards, also on a tiled roof at Broomfield.

——— *pulvinata*.

Didymodon purpureus.

Dicranum bryoides.

——— *adiantoides*. In fruit in the bog upon Galleywood Common, and in Queen's Wood, Gt. Leighs.

——— *taxifolium*. Common.

——— *glaucum*, B. In a wood by Woodham Walter Common, and in a wood adjoining Warley Common.

——— *flexuosum*, B. Upon barren heaths.

——— *Dillenii*. Very common. In fruit on Woodham Walter Common and in a wood near Galleywood Common.

——— *varium*. Side of a pond near Barn's mill, Springfield. By the side of the road about half-way between Chelmsford and Roxwell, growing upon very tenacious clay, as it always has been when I have previously gathered it.

——— *heteromallum*.

Tortula rigida. Upon a clay bank at the Hill Farm, Roxwell.

——— *muralis*.

——— *ruralis*. Generally on thatched roofs.

——— *laevipila*. Common upon trees.

——— *subulata*. Banks: frequent.

——— *unguiculata*.

——— *cuneifolia*. Banks in several places.

——— *fallax*, B. Banks in two or three places.

Barbula cylindrica, Wils. MSS. Common on trees and wood subject to be inundated by the water; in fruit on a tree near Writtle Park. I can scarcely believe this to be a variety of *Cinclidotus riparius*, as I have carefully sought for that species around where the *Barbula cylindrica* grows, and in water adjoining, but in vain. Mr. Thwaites also, makes the same remark respecting the Bristol *B. cylindrica*.

—— *latifolia*, Wils. MSS. In the same situations as the last, but not so common, and in spots that are more frequently submersed.

Polytrichum undulatum.

—— *piliferum*. Abundant on Galleywood Common.

—— *juniperinum*. Ditto and elsewhere.

—— *commune*.

—— *formosum*. On a piece of common at Little Baddow.

—— *aloides*. Galleywood Common.

—— *nanum*. Ditto. This, now considered a variety of *P. aloides*, has, when I have gathered it, grown in patches distinct from the latter, and preserved its character of rounded capsule unaltered.

Funaria hygrometrica.

Orthotrichum affine.

—— *β. pumilum*.

—— *diaphanum*. Pretty common.

—— *striatum*. Trunks of trees, generally in woods, mostly in small patches.

—— *crispum*. Ditto.

Bryum androgynum. Barren or gemmiferous state; frequent in the neighbourhood of Little Baddow. I gathered a few immature capsules on the 16th of May last. Mr. Mitten (*Phytol.* i. 616), mentions finding the fruit not quite mature in the early part of April, so that his plants seem rather forwarder than mine. The time of fruiting is not mentioned in 'English Flora.'

—— *palustre*. In fruit in a wood near Galleywood Common, and sparingly upon Woodham Walter Common.

—— *carneum*. By the side of a pond near Barn's mill, and by the side of the road between Chelmsford and Roxwell, along with *Dicranum varium*, which it has always accompanied when I have gathered it.

—— *argenteum*. Mostly fruits upon gravel-walks, in gardens.

—— *capillare*. Pretty common.

- Bryum caespitium*. On walls, &c.
- *atro-purpureum*, Br. and Sch. In similar situations not uncommon.
- *nutans*, var. On a bank adjoining Woodham Walter Common.*
- *binum*, Schreb. In the bog upon Galleywood Common.
- *roseum*, B. Upon Galleywood, Lingard and Woodham Walter Commons; most abundant and finest on the latter.
- *ligulatum*. Fruits in Bligh's Wood, Springfield, and in a little wood upon Great Boynton Hall Farm, Roxwell.
- *punctatum*. In fruit upon Woodham Walter and Galleywood Commons
- *hornum*. Ditto.
- *cuspidatum*, B. Gravel-pit near Springfield jail and at another place in the neighbourhood.
- Bartramia pomiformis*. Not very common.
- *fontana*. In fruit upon Woodham Walter Common.
- Leucodon sciuroides*, B. Frequent upon trees.
- Anomodon viticulosus*. Foliage abundant: it fruits upon Little Boynton Hall Farm.
- Daltonia heteromalla*. On a tree in a lane leading from the farmhouse to the same wood.
- Fontinalis antipyretica*. Abundant. I have found the fruit in plenty in a pond on Nabbot's Farm, Springfield.
- Hypnum trichomanoides*. Common.
- *complanatum*. Fruit unfrequent: I have only found it in one place.
- *riparium*. On wood, &c.: by the banks of streams frequent.
- *undulatum*. On Woodham Walter Common, where it fruits abundantly.
- *denticulatum*.
- *medium*. Trunks of trees along with *Barbula cylindrica*.
- *tenellum*. On stones in Springfield and Broomfield churchyards.
- *serpens*.
- *murale*. Abundant on Springfield church, also in Heybridge church-yard.

* I found a monstrosity of this with two setæ united for about two-thirds of their length from the base upwards, each bearing a capsule and becoming considerably contorted after their separation.

- Hypnum purum*. Fruits plentifully on Ramsden heath and in a little grove at Springfield and very sparingly on Galleywood Common.
- *piliferum*. Fruit very abundant in Bligh's Wood, Springfield.
- *Schreberi*, B.
- *plumosum*, B. On the ground in several places.
- *sericeum*.
- *lutescens*. In fruit on Little Boynton Hall Farm, Roxwell.
- *albicans*, B.
- *alopecurum*. Not very common in fruit.
- *curvatum*.
- *myosuroides*, B. I have not observed this with capsules, but have no doubt it occurs with them.
- *splendens*. Two plants with setæ growing up, observed on Galleywood Common.
- *proliferum*. In fruit at Chantrey Wood, near Witham, and sparingly in Bligh's Wood, Springfield.
- *prælongum*.
- *blandum*. By the side of a wood adjoining a waste piece of ground, called the Warren, near the Rodney Inn, Little Bad-dow, where it bears a few capsules.
- *rutabulum*.
- *velutinum*.
- *ruscifolium*.
- *striatum*. Rather common in fruit.
- *confertum*.
- *cuspidatum*. Fruit not uncommon in bogs.
- *cordifolium*. In the Thrift Wood, and in a wood by the Ship Inn, near Galleywood Common, in the latter place coming abundantly into fruit.
- *stellatum*. In fruit in the bog upon Galleywood Common.
- *triquetrum*. In fruit in Chantrey Wood, near Witham and the Highwoods, near Chelmsford.
- *squarrosum*. In fruit at Chantrey Wood, and sparingly on Ramsden Heath.
- *filicinum*, B. Near Queen's Wood, Great Leighs, and in a marshy place at Springfield.
- *fluitans*, B. Very common and variable, growing both in the water and in places liable to be overflowed.
- *aduncum*. Same situations.

Hypnum cupressiforme.

——— *β: compressum.* In woods.

——— *molluscum.* Common: most abundant where the land is stiff clay.

Besides these, I have found two others rather out of the distance, viz.,

Didymodon trifarius. Cliffs by the sea at Southend.

Neckera pumila. On the trunk of a hornbeam in Epping Forest.

A: GREENWOOD.

Chelmsford,

December 5, 1845.

On the occurrence of Mimulus luteus in Forfarshire. By GEORGE LAWSON, Esq.

In the report given in the October number of the 'Phytologist' (Phytol. ii. 319), of a meeting of the Botanical Society of Glasgow, held on the 24th of June last, I find *Mimulus luteus* noticed as having been mentioned in an account of a botanical trip by Dr. Balfour, read to the Society at that meeting, it having been found by him "naturalized near Largs." *Mimulus luteus* I have observed in two stations in Forfarshire: the one at Invergowrie burn, which separates the counties of Perth and Forfar, about four miles west of Dundee, and the other by the margin of the water of Dighty, at Strathmartine, four or five miles north of Dundee. At both these stations the plant is plentiful, and grows luxuriantly, being quite naturalized, and, it may be, *indigenous*; as to this, however, I will not venture an opinion. This may be interesting to the readers of the 'Phytologist,' and I think the plant deserves the particular attention of British botanists, as it may perhaps have claims to a place in the British Flora. Those who have met with it in other stations than those mentioned by Dr. Balfour and myself, will perhaps be kind enough to communicate such, with their observations, through the medium of the 'Phytologist.' Although a plant somewhat showy, it is often not easily detected, being hid by the luxuriant grass at the margins of the streams, where it usually grows.

GEO. LAWSON.

108, Hawkhill, Dundee,

November, 1845.

VOL. II.

3 B

On the Country of Cliococca tenuifolia. By CHARLES C. BABINGTON, Esq., M.A., F.L.S.

I may state that our late curator, Mr. A. Biggs, always said that the seeds of this plant were obtained from the interior of New Holland, by a person who was not a botanist, and who was, at the time of gathering them, far beyond the settled country in pursuit of bush-rangers. At the time when I published the account of the genus *Cliococca*, I had confidence in the correctness of Mr. Bigg's memory, but he has since fallen into such a state of health that it becomes quite possible that he may have committed an error, and that the seeds did really come from S. America. I trust that this is a sufficient excuse for my having fallen into an error, if that is the case.

I have so great confidence in the opinion of Dr. Walker Arnott, that I shall now believe that *Cliococca tenuifolia* and *Linum selaginoides* are very probably the same species. My description was drawn from the living plant, and I therefore feel certain of its accuracy. Lamarck's plant may perhaps be another species of the new genus to which some other *Lineæ* may be referable. These are points which I most willingly leave in the very able hands of Dr. Arnott.

CHARLES C. BABINGTON.

St. John's College, Cambridge,
December, 1845.

*Corrections of various errors in Mr. Lees' paper on the *Ænanthe pimpinelloides*, *Lachenalii* and *silifolia*.* By HEWETT C. WATSON, Esq.

WITH mingled surprise and regret I have read a paper from the pen of Mr. Lees, in the December No. of the 'Phytologist' (Vol. ii, pp. 354-365), upon the *three* species of *Ænanthe* which were so long misunderstood and confused together in this country under the *two* names of *pimpinelloides* and *peucedanifolia*. I was surprised to see so much looseness of statement and positive error again brought into the discussion, after the progress made by other botanists towards an accurate elucidation of those plants. And I regretted to see the unfriendly and ungenerous *animus* which too obviously urged on the pen and distorted the writer's judgement; and the effect of which is far more likely to be felt in a recoil upon himself, than in any damage to the individual against whom the battery was so awkwardly worked.

The uncertainties respecting these three species of *Oenanthe* had been brought into a narrow compass by the papers of Mr. Ball, Mr. Babington and myself; each of whom had successively elucidated some of the points previously obscure; although each in turn had still left some unsettled questions to be answered by others. Mr. Lees now comes forward at the eleventh hour, when the doubts are nearly all solved and settled, and contrives to write the longest paper hitherto printed on the subject; so much easier is it, to write a diffuse paper, than to give really useful information in succinct terms. In that paper Mr. Lees writes as if almost nothing had been done by others—states over again many things previously made public—commits several notable blunders—and adds very little indeed to our previous stock of real knowledge. Mr. Babington or Mr. Ball would have told in a single page all that was new and worth recording in the paper referred to. Surely, it could not be held necessary for Mr. Lees to restate those circumstances which had already been more accurately or more fully stated by preceding writers. And it was not simply unnecessary, but highly mischievous, to put forth unqualified statements, in the character of general truths, notwithstanding that facts previously on record, and certified on sufficient authority, proved some of those statements to be quite incorrect, and showed that others of them could be true only to a limited extent. Taking the three former papers (those of Ball, Babington and Watson), in connexion, the most important points left uncertain may be thus put into the form of queries:

1.—Is the *peucedanifolia* of Smith an identical species with the *peucedanifolia* of Pollich?—or, with the *silaifolia* of Bieberstein?—or, a third species distinct from both?

2.—What is the form of the leaflets of the truly radical leaves of Smith's *peucedanifolia*?—and, what is the form of its mature fruit?

Nothing whatever is attempted by Mr. Lees, in the way of answer to these queries, or the nomenclature of the species. He has a passing allusion to the names, in a foot-note on page 356, but this allusion is penned in such terms, as almost unavoidably to force us upon a supposition that Mr. Lees has yet to learn the recognized principles of botanical nomenclature. He thinks it "preferable to retain" the name of "*peucedanifolia* of Pollich," and yet he assigns no reason for a preference, which has a weight of authority against it vastly greater than any in favour of it. According to existing knowledge, and the established rules of nomenclature, the question may be held now almost entirely reduced to a choice between "*silaifolia*" and "*Smithii*."

Should it hereafter appear that Bieberstein's plant is only a variety of Pollich's, in such case the earlier name "*peucedanifolia*" must be resumed; but so long as they are esteemed two species, our British plant must take the name of that reputed species to which it truly belongs, and this is almost certainly the *silaifolia* of Bieberstein. The name of "*Smithii*" was suggested only as a temporary designation, to fall into oblivion, *provided* the British species could be referred satisfactorily to any other described species. After that name was suggested, I met with a very strong additional reason for believing the British plant to be really the *silaifolia*, as was explained in a supplementary paper on the *Oenanthe peucedanifolia* of Smith (Phytol. ii. 94). Taking that reason in connexion with the specific character and references given in Bieberstein's own work, and the papers of Ball and Babington, it seems to my judgment that every botanist, competent to give an opinion upon the matter, will hold it "preferable to retain" the name assigned to the British plant by Ball. But in this paper, to prevent confusion in contrasting the British against the continental *silaifolia*, I will use the name of "*Smithii*" to distinguish the former.

In reference to the second queries, Mr. Lees is more successful, for here he affords one small item of information, which was much wanted. He writes that the radical leaves of *Smithii* "agree entirely with the stem-leaves, namely, bipinnate, with acute, entire, lanceolate or linear pinnae" (p. 362). If correct, this is useful information; because no opportunity for ascertaining the character of the true radical leaves had occurred to Ball, Babington, or myself. It adds another fact towards showing the identity of our *Smithii* with the *silaifolia* of Koch's Synopsis. I had described the leaflets of the lower stem-leaves, as being "linear-lanceolate acute, scarcely broader than those of the upper leaves;" and had commented upon this character as a difficulty, when compared with Bieberstein's statement that the lower leaves of his *silaifolia* are much abbreviated and dilated — "*valde abbreviatis atque dilatatis*." It may be, however, that the "*valde*" is not meant to extend to "*dilatatis*;" and that this strong expression must be construed only with reference to long and narrow lower leaves in Pollich's *peucedanifolia*. Adopting this construction, and my own term "subcylindrical" to express the character of the fruit (as presently to be explained), there will remain no serious objection against a belief of the British *Smithii* being truly identical with the *silaifolia* of Bieberstein and of Koch.

Mr. Lees describes and figures the fruit of *Smithii*; and here it is necessary to correct and limit his description. He describes the fruit

"oblong, contracted below." Mr. Ball said "clavate, and somewhat contracted below." I called it "subcylindrical." Here we see three different observers using as many different terms. The fact is, the fruits vary considerably in form, even in the same umbel. I have before remarked of the three species, "while immature, the fruits of all are contracted downwards" (Phytol. ii. 15); and Ball expressly states that he describes fruits not fully mature. Apparently this form of immaturity is retained in some of the full-grown fruits of *Smithii*; as is certainly the case with those of *Lachenalii*. The *exterior* fruits, in the umbellule of *Smithii*, are rarely of equal thickness from base to summit, when full grown, but not being quite equal throughout, and moreover also somewhat angular, the term "cylindrical" requires the qualifying prefix "sub." In the *interior* of the umbellule, the fruits are compressed one by another, and (seemingly through their mutual pressure) they assume a more angular and tapering form. Such a fruit is represented in the figure given by Mr. Lees; and which is, indeed, more clavate than oblong. I presume, however, that the form of the exterior fruits should be considered typical or normal. Apparently this is also the opinion of Koch, who writes of *silaifolia* "fructibus cylindricis." The exterior fruits are nearly cylindrical, the interior being oblong-clavate and angular.

Having thus gleaned from the paper of Mr. Lees, and applied to scientific use, the little information of value which it can be said to have added to previously recorded knowledge, I next ask myself the question, 'Shall the inaccuracies of the paper be left to that inevitable fate which ultimately befalls all error? or is it better at once to qualify and correct them, in order to check the temporary mischief consequent on the propagation of errors?' There is inconvenience in the latter course. Easy as it is, to state simple facts in concise terms, it is by no means equally easy to apply them in the correction of errors and inaccuracies, without adding quotations and explanations which would greatly extend the necessary amount of text. I will therefore not attempt to quote in detail, and then to correct, *all* the inaccuracies and untenable statements which occur in the paper of Mr. Lees. Instead of pursuing that course, I will mention some of the circumstances which seem calculated to place the subject of discussion in a more correct position; though even this will unavoidably lead to repetitions and explanations, which have become necessary only through the faults of Mr. Lees' paper.

As before explained in the 'Phytologist,' the misapplication of the names "*pimpinelloides*" and "*peucedanifolia*" to the British species known to Smith, was mentioned in the 'British Flora' of 1838, or some earlier date; and it is to be regretted that the author of that work did not then substitute the names "*Lachenalii*" and "*silifolia*" in their stead. The (reputedly) true *Linnean* *pimpinelloides* was certainly in some British herbaria before that date; but its various collectors had apparently always mistaken it for *Lachenalii* — in other words, for *Smith's* *pimpinelloides*. There is no reason to suppose that any British specimen of the true *pimpinelloides* had come under the examination either of Smith or of Hooker.

In or about 1842, specimens of *Lachenalii*, correctly so labelled, were sent to the Botanical Societies of London and Edinburgh, from the locality of Michelfeld, near Basle; a locality which brings the plant home, or nearly so, to the 'Flora Badensis' of Gmelin. Probably these specimens came under the eyes of Mr. Babington, who could appreciate their value. He had retained Smith's nomenclature in the 'Edinburgh Catalogue' of 1841, but substituted the name "*Lachenalii*" (instead of "*pimpinelloides*") in his Manual, which was published in May, 1843. The specimens received by the London Society, at the same time, passed through the hands of their curator; the identity of these specimens with Smith's *pimpinelloides* remaining unobserved there, until I stumbled upon one of them accidentally, late in 1844, while looking out something else.

As for *Smithii*, whenever found in England, it appears to have been rightly referred to Smith's *peucedanifolia*. But many botanists fell into the error of referring their examples of *Lachenalii* also to the *peucedanifolia* of Smith. It was obvious to me that such was the case, even some years before I had seen a specimen of *Smithii*. But my herbarium then containing only imperfect specimens of *Lachenalii*, and neither of our other two species, I saw the error without being able to correct it properly. There is a passage on page 411 of the 'New Botanist's Guide' (1837), in which the misnomers are mentioned; but, of course, the "*pimpinelloides*" there spoken of was that of Smith and 'English Botany,' not the species now believed to be that of Linnæus. No instance has come under my knowledge, where *Smithii* was mistaken for *Lachenalii*: the errors were always the converse of this.

When did the *Linnean* *pimpinelloides* become known as a British plant? In May of 1840, I had brought a young plant of it, from the Isle of Wight, to my garden, where that specimen and its descendants

are still growing. During a great part of the summer of 1841, and the whole botanical season of 1842, I was absent from home; but in 1843 I began to consider what this same plant really was. Even at this late date, however, I was still at fault about the other two species; one of which (*Smithii*) I had never seen alive, and the other (*Lachenalii*) only twelve years before, when I was quite a beginner in Botany. About the close of 1843, I compared my garden plant with the Sardinian specimen of *pimpinelloides* (*Linn.*) in the herbarium of Sir William Hooker; and of course that species was then clearly proved a native of Britain. In 1844, Professor Balfour kindly supplied my garden with living plants of *Lachenalii*, and in the autumn of that year, I again collected that species on the coast of Devon. Of *Smithii* I have seen dried specimens only.

Mr. Ball appears to have been the first botanist (Mr. Lees excepted, of whom I will presently speak) who got together specimens of *all three* species, in a sufficiently good condition for determination. Mr. Babington was in train, however, and I suspect that he had failed to determine the plants, through not possessing a sufficient set of specimens. I had, indeed, given him garden examples of the Isle-of-Wight *pimpinelloides*, dried in 1843; but these having been sent simply to illustrate changes in the roots, according to age, they were not well calculated to show an unfamiliar species distinctly, and in his paper of June, 1844, they appear to be alluded to as examples of *Lachenalii*.

Meantime, what was Mr. Lees doing? This gentleman had seen and collected all three species in a living state. His advantages and opportunities were thus greatly superior to those enjoyed by any other botanist; and it is truly remarkable that he should have done nothing towards their elucidation. Speaking of the species by their present names, his operations were these:—1. He collected *pimpinelloides*, and mistook it for *Lachenalii*. 2.—He collected *Lachenalii* and mistook it for *siliafolia*. 3.—He collected *siliafolia* and gave it a right name (*peucedanifolia* of Smith), and yet he failed to see that it was a different thing from *Lachenalii*.

We all blundered through deficiency of specimens. But Mr. Lees thoroughly beat all of us at blundering. He saw all three species in a living state, and in their native localities, and yet he blundered more than any of us. It is true, as stated in the 'Phytologist,' that he labelled his specimens of *pimpinelloides* (*Linn.*) with the name "*pimpinelloides*;" but he did so under the mistake of supposing it the Smithian plant so named. The species was mistaken, though the name was right by a misapplication. It was the name of *Smith's*

species applied to the *Linnean* species. There is no ground for supposing that Mr. Lees had the slightest idea of his specimens being anything different from the Smithian *pimpinelloides*. His labels, up to 1843, show that he referred plants of the latter species to Smith's *peucedanifolia*. And even in the paper which calls forth this present one from myself, he still confuses the Linnean and Smithian *pimpinelloides*, as though he thought them one and the same thing, because they have been unfortunately designated by the same name.

If any reader should doubt the possibility of this confusion of ideas so late in the discussion, he has only to read some few lines in the middle of page 355 of Mr. Lees's paper, and he will see a glaring proof that such is the case. The plant of the "driest ground" is the Linnean *pimpinelloides*; the plant of "salt-marshes" is the Smithian *pimpinelloides* — really *Lachenalii*; and yet these two allied situations of growth are there put in opposition to each other, as if they really had been assigned for the same single species only. The like strangely illogical confusion of ideas is again repeated about the middle of page 362, where the author is writing about the involucre bracts of "*pimpinelloides*;" the Linnean and Smithian species being still confounded together, and Smith's statement, respecting the bracts of *one* species being disputed, because Mr. Lees finds something different in the bracts of the *other* species.

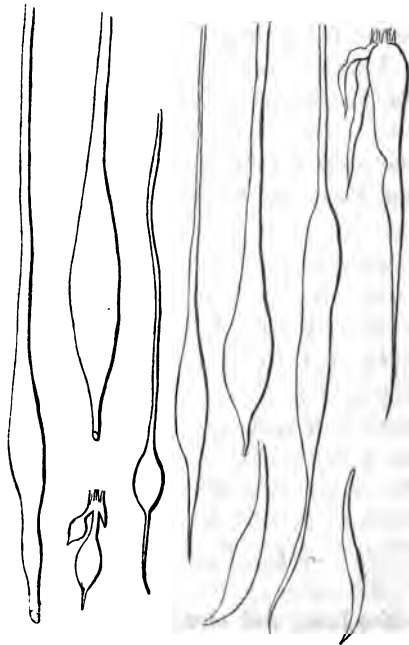
I have thus dwelt on the history of these plants, or, rather, that of our knowledge of them; because, unless we can clearly make out which species was intended at different dates, under the same name, the recorded localities will still lead to many mistakes. In most of the localities recorded for *pimpinelloides* (*Smith*), before 1844, we may expect to find *Lachenalii*; which is only another name for the same species. To this, it may be presumed, we shall have exceptions in any localities recorded by Mr. Lees; and in these we may expect to find the species *now* designated *pimpinelloides* (*Linn.*). In localities recorded for *peucedanifolia* (*Smith*), we may sometimes find that species; but as frequently it will be the *Lachenalii*. As far as I have seen specimens, all the Scottish and Irish localities, assigned for *peucedanifolia*, belong to *Lachenalii* only. My own account of the ascertained distribution of the three species, derived from specimens examined, is more complete than that attempted by Mr. Lees (*Phytol.* ii. pp. 13, 14, 15).

My remarks are running out so far that I must pass over some other inaccuracies without allusion; but Mr. Lees' description of the roots of the three species is so confidently expressed, although far

indeed from the whole truth, that it will certainly perplex and mislead those who rely implicitly upon his text and figures. That gentleman's two first figures give excellent representations of the roots of *pimpinelloides* and *peucedanifolia* (Smithii) in what may be deemed their typical or usual forms. The third figure, intended to represent the root of *Lachenalii*, is much less successful. I have occasionally seen roots almost as slender and tapering, on plants which had probably grown in very damp ground or ditches. But the examples which I dug up on the coast of Devon (among *Juncus acutus*) in 1844, and many of those which I have examined from other localities, had tuber-like roots, far thicker and shorter than those represented in the figure of *Lachenalii*; being, in fact, much nearer, both in size and shape, to the tubers of *Smithii*, as represented and described by Mr. Lees.

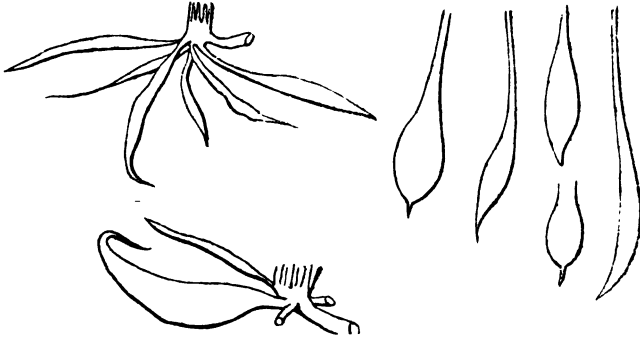
In my former paper, of January, 1844, I remarked about the tubers of the three species — “Still they vary greatly, even in the same species; and single tubers might be taken from one species which would then readily pass for those of another” (*Phytol.* ii. 12). Notwithstanding this statement, the simple expression of facts actually in existence, and ready for the eyes of any botanist who might choose to look at them—Mr. Lees confidently asserts that the species may always be distinguished by the roots alone, as figured and described by himself; that is to say, by terms and figures which absolutely deny the smallest approximation or resemblance between the roots of the three species. Whence springs this utter disregard and virtual contradiction of the published statements of another botanist, whose practical acquaintance with plants may at least be pronounced equally extensive as that of Mr. Lees himself?

The annexed cuts show various forms of the tubers in each of the three species. With one exception, the specimens from

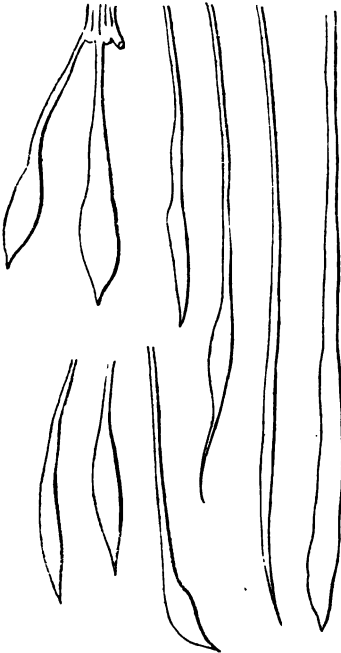


C. pimpinelloides, Linn.

which they are copied are all in my own herbarium. I am perfectly certain (from the fruit, leaves and other characters) that these tubers really belong to the respective species to which they are assigned in



C. peucedanifolia, Sm.



C. Lachenalii, Gmel.

the cuts. Being copied from dried specimens, they are probably rather thinner, and of course more distorted, than would be the case in fresh examples; but the process of desiccation could never thus convert the tubers of one, into almost precise similitudes of the tubers of another species: it is Nature who does that part of the business.

The two tubers of *Lachenalii*, which are represented as attached to the base of a stem, are copied from one of the Basle specimens belonging to the Botanical Society of London. The others are all from British specimens in my own herbarium. Nobody can deny that those two tubers are more like Mr. Lees' figure of *peucedanifolia*, than his figure of *Lachenalii*. Several of the Basle specimens, however, had roots quite long and slender. The carrot-like tuber of *pimpinelloides* is the root of a young plant; the rest are from specimens in flower or

in fruit. After looking at these forms, readers of the 'Phytologist' will understand the necessity of limiting and qualifying Mr. Lees' hasty generalizations. And they will be prepared to believe that even good botanists might mistake one species for another, if deciding by their roots alone. I have put this to the test of a direct experiment by sending roots of the Shanklin pimpinelloides, which is undoubtedly the true species, to one of our best English botanists; ripe fruit being also sent to assist his judgment. This botanist, *expressly referring to Mr. Lees' own statements about the roots of pimpinelloides*, most confidently pronounced the plant to be — LACHENALII!*

HEWETT C. WATSON.

Thames Ditton,

December, 5, 1845.

On the occurrence of Melissa officinalis near Chelmsford. By
ALFRED GREENWOOD, Esq.

THIS plant grows by the road-side between Chelmsford and Galleywood Common, not far from the Running Mare public-house. There are no gardens in the immediate vicinity, and Mr. Thomas Corder, who first pointed the station out to me, states that it grew there eight years ago, he believes before the nearest cottages and gardens adjoining were in existence.

I have also found this plant still further removed from garden cultivation, by the side of a field between Great Bakering and Foulness Island.

A. GREENWOOD.

Chelmsford, November 28, 1845.

* " In *CE. pimpinelloides* the stem dies away after the seed has ripened. Young plants grow up around its base, in the form of suckers. The roots of these young plants at first consist of a cluster of filiform fibres. When the plants are more advanced in growth, we find fibres which have thickened much for a part of their length, so as to form one elliptic or fusiform tubercle on each fibre. The upper portion of the fibre, above the tubercle, usually remains thin and forms a peduncle by which the tubercle is attached to the base of the stem. The peduncles vary in length on the same plant. If nearly obliterated (by the tubercle forming near the base of the growing stem, or being much elongated) we may have a root such as is represented in the figure of *CE. peucedanifolia* of 'English Botany,' plate 348."—*H. C. Watson*, in '*London Journal of Botany*,' Feb., 1844.

Rarer Plants observed at Halstead, Essex. By T. BENTALL, Esq.

HAVING for several years past devoted a great portion of my leisure time to the examination of the flowering plants of Halstead, I have thought that a list of the rarer species which have come under my observation might not be altogether uninteresting to the readers of the 'Phytologist.' In order to avoid the necessity of giving localities, and for other reasons, I consider it advisable to confine myself exclusively to Halstead, consequently all the species enumerated below must be considered as occurring within the limits of that parish. Those to which an asterisk (*) is prefixed have probably been introduced.

Ranunculus circinatus. Abundant in several localities.

—— *hirsutus.* Not uncommon.

—— *parviflorus.* Rare.

Myosurus minimus. Not uncommon.

Aquilegia vulgaris. Very rare.

**Barbarea præcox.* Rare.

Cardamine amara. Common.

Sisymbrium Sophia. Rare.

Thlaspi arvense. Ditto

Dianthus Armeriæ. Ditto

Silene anglica. Ditto

Hypericum Androsæmum. Not uncommon.

—— *maculatum.* Frequent.

Rhamnus catharticus. Rare.

—— *frangula.* Frequent.

Trifolium ochroleucum. Common.

—— *scabrum.* Rare.

Lathyrus aphaca. Ditto

—— *Nissolia.* Ditto

Potentilla argentea. Not uncommon.

Fragaria elatior. Rare.

**Rubus idæus.* Frequent.

—— *nitidus.* Ditto

—— *leucostachys.* Ditto

—— *carpinifolius.* Rare.

—— *β. roseus.* Frequent.

—— *corylifolius.* Ditto

—— *rudis.* Rare.

Rubus Kæhleri. Very common.

—— *fusco-ater.* Rare. I give this on the authority of Dr. Bell Salter, from whose pen some valuable remarks upon this species will be found in the 'Phytologist' for May, 1845. I cannot refrain from expressing my great obligation to this gentleman for the many valuable hints upon various species of *Rubus* with which, from time to time he has so kindly favoured me.

Rosa tomentosa. Frequent.

—— *systyla.* Rare.

—— *rubiginosa.* Ditto

Pyrus torminalis. Not uncommon.

Epilobium roseum. Ditto

Myriophyllum verticillatum. Plentiful in one locality.

Sedum dasyphyllum. Rare.

Ribes rubrum. Not uncommon.

Chrysosplenium alternifolium. Rare.

* *Carum carui.* Not uncommon.

Ænanthe Phellandrium. Frequent.

—— *fluviatilis.* Plentiful. It appears to me impossible to entertain a doubt as to this and the preceding species being truly distinct.

Torilis infesta. Common.

Galium tricornne. Rare.

Dipsacus pilosus. Frequent.

Tragopogon porrifolius. Rare.

Cnicus acaulis. Ditto

Conyza squarrosa. Frequent.

Anthemis arvensis. Rare.

* *Centaurea solstitialis.* Ditto

Campanula hybrida. Abundant on the light sandy soils.

Cuscuta europæa. Rare.

* ——— *Trifolii.* Ditto

* *Anchusa sempervirens.* Rare.

Myosotis cæspitosa. Frequent.

—— *sylvatica.* Ditto

—— *collina.* Ditto

Linaria Elatine. Rather rare.

—— *spuria.* Ditto

Veronica polita. Common.

—— *Buxbaumii.* Frequent.

Lycopus europæus. Common.

Mentha viridis. Rare.

the pimpinelloides, and marked H. U., showing that it came from the Upsal garden, is most decidedly that species which has lately been added to the British Flora, and by no means the *Cēnanthe pimpinelloides* of Hudson, Smith, and subsequent British authors. It is true that there is no root, but the radical leaf is decisive. Our librarian, Mr. Kippist, with his usual accuracy, reminds me that I ought to state that this leaf is detached from the stem. The cause of this is evidently the small-sized paper on which Linnæus' specimens are fixed. To this paper is pinned another, with an unnamed specimen of a very different plant, unknown to me, then follows one, again named *Cēnanthe pimpinelloides*, and marked H. U. In this specimen the radical leaf is somewhat different from the first as to the sharpness of the incisions, but not more so than the leaves of two plants which I have growing, given to me by Mr. Borrer, from Dr. Bromfield, one with round bulbs, the other with oblong. There is another which I think is a very wretched specimen of *Cēnanthe peucedanifolia*, but it is not named, and therefore is of no avail whatever. I may here mention that Jacquin's figure in "*Flora Austriaca*," 394 (not 395, as erroneously quoted) is a truly excellent delineation of the *Cēnanthe pimpinelloides*, *Linn.*, and is rightly so named.

In the herbarium of Smith, the specimen named by him *Cēnanthe pimpinelloides* is undoubtedly the plant we have now learnt to call *Cēnanthe Lachenalii*, and is very distinct from the Linnean *Cē. pimpinelloides*. One specimen is from "Aber, *Hugh Davies*," and one from "Scotland, *Mackay*, vide 'English Flora,' ii. 60," then comes another, whether his own or his friend *Daval*'s does not appear. This is a very interesting specimen of the same plant; it is unnamed, but marked "*Hort. Lachenal, the Michelfeld plant*," clearly meaning that it was gathered in Lachenal's garden, from a plant originally from Michelfeld. I have not been able to meet with *Gmelin*, '*Fl. Bad.*' in which it seems to have been first named. *Koch* has a synonym "*Cēnanthe Michelfeldiense, Lachenal.*" This may be from some garden catalogue, or a temporary manuscript name, for it does not occur in *Steudel*. The specimen in Smith's herbarium is strong corroborative evidence.

I have no doubt that Mr. Lees is correct in his account of the soils in which these plants are found, but I would beg to call his further attention to the dry places he mentions for *Cēnanthe pimpinelloides* and to suggest whether these may not be an exception to a general rule, for I cannot help fancying that the habit of the plant in my garden is that of a bog plant. We know that many plants sport in this

way, for example, *Scrophularia aquatica*, in dry chalk-pits, *Orchis conopsea*, in wet marshes, and many others. With regard to *Ænanthe peucedanifolia*, surely "denizen" must be a slip of the pen, for it is impossible to think that this is a naturalized plant, not indigenous. Of *Ænanthe Lachenalii* I should say with Hudson, "*in paludibus maritimis frequens*;" it scarcely deserves a particular habitat.

EDWARD FORSTER.

Woodford, December, 1845.

Worcestershire habitat of Ænanthe Lachenalii. By ROBERT J. N. STREETEN, M.D.

YOUR correspondent, Mr. Lees, to the general accuracy of whose description of the species of *Ænanthe* I have pleasure in bearing testimony, will find *Ænanthe Lachenalii* growing in considerable plenty in the muddy ditches on Defford Common, in this county, and especially in the vicinity of the salt spring. I gathered the plant in this locality in the year 1840, considering it to be, at that time, the *Æ. pimpinelloides* of the 'English Flora.' Soon after the publication of Mr. Babington's Manual, and the papers by Mr. Ball and others in the 'Annals of Natural History,' I satisfactorily ascertained the Defford plant to be the same as that described under the name of *Æ. Lachenalii*, and requested Mr. Reece, the intelligent sub-curator of the Worcestershire Natural History Society, to collect specimens for the Society, having myself again previously visited the locality and obtained specimens of the plant, though too early for the fruit. Some of Mr. Reece's specimens collected in September, 1844, are now in the herbarium of the Society. The Defford plant, like Mr. Lees' plant on Welland Common, is accompanied by *Helosciadium nodiflorum*.

ROBERT J. N. STREETEN.

Worcester, December, 1845.

Correction of some errors in the papers on the species of Ænanthe, in the Phytologist for January, 1846. By H. C. WATSON, Esq.

SOME errors, either of the pen or of the press, occur in my own paper on the species of *Ænanthe*, in the *Phytologist* for this month. I beg leave to correct those errors, because they alter and vitiate the

meaning of the passages in which they occur. At the same time, I will take the liberty also of correcting one or two errors (as I conceive them to be) in the paper of Mr. Forster, in reference to the specimens in the Linnean herbarium. Perhaps it will be the readiest way of putting right my own expressions, if I quote the sentences, and interpolate the corrections at their proper places.

Page 391. — "Nothing whatever is attempted by Mr. Lees in the way of answer to these queries, or [queries on] the nomenclature of the species."

Page 393. — "The exterior fruits in the umbellule of *Smithii*, are rarely [nearly] of equal thickness from base to summit when full grown."

Page 396. — "And yet these two allied [alleged] situations of growth are there put in opposition to each other."

Page 404. — Mr. Forster writes "In the herbarium of Linnæus, the specimen named by him *Œnanthe pimpinelloides*, and marked H. U. showing that it came from the Upsal garden, is most decidedly that species which has lately been added to the British Flora, and by no means the *Œnanthe pimpinelloides* of Hudson, Smith, and subsequent British authors. It is true that there is no root, but the radical leaf is decisive. Our librarian, Mr. Kippist, with his usual accuracy, reminds me that I ought to state that this leaf is detached from the stem. — To this paper is pinned another, with an unnamed specimen of a very different plant, unknown to me; then follows one, again named *Œnanthe pimpinelloides*, and marked H. U. — There is another, which I think is a very wretched specimen of *Œnanthe peucedanifolia*, but it is not named, and therefore is of no avail whatever."

Doubtless it will become me to consider well what I say, in expressing opinions exactly opposite to those of the respected botanist whose words I have just quoted. But I have had the species of *Œnanthe* so much in thought and observation during the past twelve months, and have examined so very many specimens from different localities in Britain, Europe and Asia, that I cannot help feeling myself familiar with their appearance and characters. I had carefully compared British specimens with those of the Linnean herbarium, before I ventured to say, while writing of *pimpinelloides*, in a former number of the 'Phytologist' (Jan. 1845), twelve months ago, that "the specimens in the Linnean herbarium, wanting root and fruit, apparently belong here." Curiously enough, it was precisely that "unnamed specimen" thought so different by Mr. Forster, which satisfied me of the identity of our British species with that of Linnæus; while the

single detached leaf, on the other sheet of paper, came in as a difficulty, and induced me to write "apparently belong" instead of "certainly belong."

Since reading the remarks of Mr. Forster, I have again compared British specimens with those of Linnæus, and still I can only come to the same conviction. The unnamed specimen, pinned to the named one, is exactly identical with specimens sent from Powick, by Mr. Lees, to the Botanical Society of London; as also with my garden plant, originally from the Isle of Wight, and with wild specimens, kindly supplied to me from the same island by Dr. Bromfield. The detached leaf *may* belong to this species also; though I do not yet feel assured on that point.

The "wretched specimen," also without name, which Mr. Forster thinks may be referrible to *Cœnanthe peucedanifolia*, is most assuredly not Smith's species so called — our *silaifolia*: the fruit is quite different, and brings it nearer to *globulosa*. Possibly Mr. Forster may have been misled in this instance, by Smith's herbarium, in which a foreign fragment in fruit (probably of *globulosa*) is fastened on the sheet of paper, which holds his British specimen of *peucedanifolia*. In my earlier paper, which described the three species (*Phytol.* ii. 12), I mentioned Smith's blunder, for he has obviously described the fruit of a wrong species in the 'English Flora,' and thus led to no little confusion. The *Cœ. globularis* (if I remember right, such is the manuscript name) of the Linnean herbarium, seems different from the *globulosa* of more modern authors, and looks much like another example of *pimpinelloides*; but this remark is simply from recollection of it.

I presume that Mr. Forster did not honour me by looking at my paper on these *Cœnanthes* in last year's 'Phytologist' for January; otherwise he would have seen that I particularly mentioned the Basle specimens, in describing *Lachenalii* (*Phytol.* ii. 14). I have not yet discovered any errors in that paper. But I do believe myself able to point out errors in *all* the other descriptive papers on these plants, whether printed in the 'Phytologist' or in the 'Annals.' For the greater accuracy of that paper, I may acknowledge my obligations to the specimens procured through the Botanical Society of London — an institution now quite unrivalled in the assistance which it affords members towards obtaining desiderata in British Botany.

HEWETT C. WATSON.

Thames Ditton, January 7, 1846.

Correction of an error in Mr. Malleson's paper (Phytol. ii. 368).

By WILLIAM BORRER, Esq., F.R.S.

It may be worth while to correct an inaccuracy in Mr. Malleson's late communication to the 'Phytologist' (ii. 372), into which the writer was led by a too implicit reliance on my *primâ facie* knowledge of Carices. The *Carex* growing near Pulborough, which I took for *C. axillaris*, proves to be the little known *C. Boenninghausenia*, agreeing precisely with Mr. Coleman's Hertford plant, and with the figure in Künze's Supplement to Schkur. Dr. Bromfield has found the same in the Isle of Wight, and it may very probably have been overlooked or mistaken for *C. axillaris* in other places. Mr. Mitten has found the true *C. axillaris* at Hurstpierpoint. *C. Boenninghausenia* has the glumes more membranous than *C. axillaris*, and the beak of the fruit not bifid, differences which Mr. Malleson himself has remarked in the Pulborough plant.

W. BORRER.

Henfield, December 3, 1845.

BOTANICAL SOCIETY OF EDINBURGH.

Nov. 13, 1845.—Dr. Douglas MacLagan, President, in the chair.

The President, on taking the chair, begged to offer a few remarks on the present state and prospects of the Society. During the past, as well as former sessions, many valuable papers had been read to them, and much interesting botanical information, especially on some of the more obscure classes of vegetables, had been brought before the public through the medium of their Reports and Transactions. In one respect only the Society had been deficient; he meant in the attendance of members at its meetings. This was owing, in great measure, to the circumstance, that almost all the members were professionally occupied, and, therefore, unable to give to a purely scientific society, that attendance which they were able to bestow on professional societies and meetings. During last session, they had also felt a great blank in the absence from their meetings of their former distinguished president, Dr. Graham, whose long and painful illness had, for many months previous to his death, precluded his taking any part in their proceedings. Dr. M. felt it to be unnecessary in such a meeting to eulogize the character of Professor Graham. They all

not only knew him to be a zealous cultivator and successful teacher of Botany, but they had individually found in him a kind, upright, and sincere friend. His affable manner, conjoined with his highly honourable deportment, had procured for him the respect and esteem of all who had the pleasure of knowing him.

It was a gratification to find in Dr. Graham's successor, the gentleman to whose zeal and activity the Botanical Society of Edinburgh owed its origin. He congratulated Dr. Balfour on his return to his native city, and expressed the hope and expectation that in his new position he would materially support and advance the interests of the Society.

Samuel Hailstone, Esq., F.L.S., &c, Horton Hall, near Bradford, was elected a non-resident Fellow of the Society.

The following communications were read:—

1. Contributions to the Physiology of Fecundation in Plants. By George Dickie, M.D., Lecturer on Botany in the University and King's College of Aberdeen.

2. Remarks on some forms of *Rubus*. By T. Bell Salter, M.D., F.L.S., Ryde, Isle of Wight.

Mr. James M'Nab exhibited a specimen of silk cotton (*Bombax Ceiba*), and mentioned that this substance was under trial in this city, with the view of its being employed in the manufacture of hats.

Specimens of *Barkhausia setosa*, gathered near North Queensferry, by Andrew Dewar, Esq., Dunfermline, were placed on the table.

December 11th, 1845. — Dr. Archibald Inglis in the chair.

Donations to the Library and Museum were announced from Dr. Dickenson, Liverpool; W. Brown, Esq., R. N.; Philosophical Society of Glasgow; Literary and Philosophical Society of Liverpool; and Professor Koch, Erlangen.

Ralph Holden, Esq., and John Waller, Esq., were elected resident Fellows of the Society.

Mr. J. M'Nab read a continuation of his journal of a tour through part of the United States and the Canadas. The last portion communicated to the Society gave an account of the botanical rarities observed in the neighbourhood of Toronto, and concluded with an excursion from Fort Niagara to Queenston, and thence to the Falls. The portion of the journal describing the remarkable distribution of the trees, shrubs and herbaceous plants in the vicinity of the famous Falls, having been read before the Society at a previous meeting, was therefore omitted.

In the present notice, embracing the journey from Niagara to New

London, Mr. M'Nab particularly alluded to the excellent state of the cultivated grounds through the Hamilton and Gore districts, and the suitableness of large tracts of wooded country for emigrants. On some waste land round the head of Burlington Bay, many good specimens of herbaceous plants were picked in flower; of these the *Lespedeza hirta*, *Polygala verticillata*, *Gerardia tenuifolia*, and *G. pedicularia*, were abundant, with *Chrysopsis alba*; the latter plant being noticed for the first time as an inhabitant of Canada. Two strong-herbaged grasses, *Andropogon furcatus* and *Limnetus cynosuroides*, were mentioned as abounding in the neighbourhood of Hamilton, but neither seemed to be relished by cattle. The moorland ground in the vicinity of Brantford afforded many interesting botanical rarities, among which *Euphorbia corollata* was conspicuous. *Liatris stricta*, *Aletris farinosa*, *Lespedeza frutescens*, *Batschia Gmelini*, *Arenaria stricta*, *Viola palmata*, with many others, were plentiful in flower, and proved most attractive objects on the dry sandy plains; while the moister places yielded *Tofieldia glutinosa*, *Zigadinus chloranthus*, and *Glycine apios* in profusion. The forests through the inland districts were exceedingly rich and varied, many of them containing large and lofty trees of oak, elm, beech, hickory, ash, and white pine. Some of these districts, in the process of clearing by the recent settlers, presented a very remarkable appearance in consequence of large groups of stately trees standing dead, many with stems from ten to fourteen feet in circumference, and varying from eighty to one hundred feet in height. The mode resorted to by the settlers for killing the trees is by cutting, during the early part of winter, a notch five or six inches deep round the lower part of their stems. The white pines presented a very singular appearance caused by a peculiar seeming twisting of the decayed trunks in a uniform direction from left to right throughout their whole length. During the drying of the stems numerous fissures or rents are formed in a spiral manner from 1-8th to half an inch in width, about four inches deep, and generally from four to ten inches distant at the bottom, presenting a ragged edge and narrowing upwards, causing the bark to fall off in large flakes. When dead, they are hewn down, piled in heaps, and set fire to. The quantity of splendid timber annually consumed in this way was described as being very great; but being at a distance from water communication it is rendered comparatively worthless. Many of the road-sides through the wooded districts for miles together, were richly adorned with the scarlet and blue cardinal flowers (*Lobelia cardinalis* and *siphilitica*), and the crimson *Monarda* (*Monarda didyma*). The Ame-

rican elderberry (*Sambucus Canadensis*), also presented a striking feature, being very abundant and densely clothed with fruit. The only tree noticed by the party, not previously seen in any other district, was the Tamarack, or black American Larch (*Larix pendula*). This tree, of which there was an extensive forest on the banks of the Thames river, near New London, was generally of straggling growth, and never exceeded three feet in circumference.

Dr. Balfour read an account of a botanical trip to Ben Voirlich and Ben Nevis in August last. He gave an account of the general features of the district, and noticed the occurrence of moraines and large angular boulders near the upper part of Loch Lomond, and the smooth rounded rocks, with distinct groovings, which are seen near the waterfall of Glen Nevis: both of these phenomena being probably indicative of the former existence of glaciers. He then gave an account of the Flora, and noticed the occurrence of *Carex irrigua*, near Loch Hoy; of *Isoetes lacustris*, *Carex saxatilis* and *Poa Balfourii*, in large quantities on Ben Voirlich; and of *Lysimachia vulgaris*, *Carex vesicaria*, *Rubus affinis*, *suberectus*, and *adula* var. *foliosus*, Bab., near Inverarnon. After noticing the varieties of *Quercus pedunculata* and *sessiliflora*, which occur in Glen Falloch, he proceeded to give a detailed account of the Botany of Ben Nevis. Besides the usual alpine plants, he picked *Saxifraga rivularis*, *Stellaria cerastoides*, *Poa alpina vivipara*, *Poa laxa* and *Poa montana*, *Cornus suecica*, *Cistopteris dentata*, *Carex saxatilis*, and various alpine forms of *Hieracia*.

Specimens of the plants were exhibited to the meeting.

At this meeting the election of office-bearers for the ensuing year took place, when Professor Balfour was chosen President, and Drs. Greville, Seller, Archibald Inglis and Douglas MacLagan, Vice-presidents.

January 8th, 1846. — Professor Balfour, President, in the chair.

The Treasurer read a letter from Mrs. Graham, presenting to the Society some valuable MS. papers on botanical subjects, by the late Professor Graham.

W. Ivory, Esq., W.S., 26, York Place, was elected a resident Fellow of the Society.

The following communications were read:—

Notice regarding some species of plants recently observed as natives of Britain, by Mr. Evans. Among the species referred to in this notice, were *Alsine stricta*, *Carduus arvensis*, β . *setosus*, *Glyceria*

plicata, *Barkhausia setosa*, &c., specimens of these, and of *Silene italica*, from two Scotch stations, were exhibited to the meeting.

Dr. Balfour read a short notice from Dr. R. C. Alexander, relative to the Flora of Sicily. Dr. Alexander regards the Sicilian Flora as not an aboriginal one, but as derived from Africa on the one side, and from Greece and other Mediterranean countries on the other. The plants peculiar to this island are by no means numerous, and the Flora is meagre when compared with that of Dalmatia and other countries on the shores of the Adriatic. In the course of two months' residence in the island Dr. Alexander found only about 250 species which he had not seen in Dalmatia.

A communication was also read from Dr. Alexander regarding the plants found on the Apennines. He considers the Flora of the Apennines from Piedmont downwards, to be also a derived one; for excepting the genera which occupy fallow land and broken ground, such as *Medicago*, *Ononis*, *Convolvulus*, and sea-shore plants, he found no genus developed, but a species of one type and a species of another, without connecting links. On ascending the mountains, when he got to a region where a magnificent Flora ought to be, he found at most a hardy hill plant that had crept up, but nothing whatever of an alpine nature.

On the Matese, about forty miles north of Naples, vegetation nearly ceased at about 6000 feet, and at the top, which is 7000 feet above the level of the sea, and where there is a snow-field that never entirely melts, and therefore cold enough for alpine plants, he met with *Aubrietia Columnæ*, (a mere variety of *A. deltoides*), *Ranunculus montanus*, a *Geranium* resembling a Carniolian species, *Arabis alpina*, an *Allium* not in flower, *Scrophularia glandulosa*, and three forms of *Saxifraga aizoon*, which are reckoned by some as species. In nearly the same latitude, on the other side of the Adriatic, on the Biakovo, near Macarska, in Dalmatia, there is, at the same height, a most interesting alpine Flora, and in *Ætolia*, in the M. Velugo, one equally so. Dr. Alexander found the Apennines by no means so productive as the Alps of Upper Styria and Upper Corinthia; and he looks upon the range as probably so recent in its formation, as to be only receiving its alpine Flora gradually from other districts.

Dr. Balfour also read a communication which he had received from Mr. Campbell, of Islay, relative to mummy wheat, specimens of which were exhibited. The wheat sent by Mr. Campbell resembled what is called Bellevue Talavera. Other specimens of the so called mummy wheat were shown, having all the characteristics of Egyptian

wheat (*Triticum compositum*). There appeared to be great doubts as to the fact of the wheat found in mummy cases having germinated. In all the instances mentioned, there are numerous sources of fallacy which have not been guarded against. The most authentic and best corroborated instance of the germination of mummy wheat seems to be that noticed by Mr. Tupper, who got from Mr. Pettigrew grains which had been taken by Sir Gardiner Wilkinson from some alabaster sepulchral vases. Even in this case, however, it is difficult to prove that the grains had not been recently inserted into the vases. The wheat which was then produced was the same variety as that now sent by Mr. Campbell.

A communication was read from Mr. Cruickshank, regarding the discovery of *Typha angustifolia* in Lochmaben Loch, and of *Centunculus minimus* near Dumfries.

Specimens were exhibited by Dr. Balfour of *Mentha rotundifolia*, var. *velutina*, in flower, and of *Pyrus pinnatifida* in fruit, from the island of Arran.

Mr. James M'Nab exhibited specimens of *Ardisia crenulata*, from the Horticultural Society's garden, in which the seeds had germinated within the berries while hanging on the plant.—*W. W. E.*

BOTANICAL SOCIETY OF LONDON.

November 7, 1845.—Edward Doubleday, Esq., V.P., F.L.S., in the chair.

The Secretary announced that foreign plants had been received from Mr. R. J. Shuttleworth, Mr. Guthwick and Dr. Baird, and British plants from Mr. G. S. Gibson, Mr. W. L. Notcutt, Mr. N. M. Watkins, Mr. M. Moggridge, Mrs. Robinson, Mr. B. D. Wardale and Mr. T. Bentall.

Read, "Notice of the discovery of *Carlina racemosa* (*Linn.*), in Arran Island, Galway Bay, Ireland, in August last, by W. Andrews, Esq., M.R.I.A. A specimen was exhibited.

November 29, 1845.—Ninth Anniversary. J. E. Gray, Esq., F.R.S., &c., President, in the chair.

From the Report of the Council, it appears that sixteen members had been elected since the last anniversary, and that the Society now consisted of 182 members. It was stated that the Report of the herbarium committee would appear in the spring, and that the exertions

of the members to obtain rare and interesting plants had been attended with the greatest success. The Report was unanimously adopted, after which a ballot took place for the Council for the ensuing year, when the chairman was re-elected President, and he nominated John Miers, Esq., F.R.S., and Edward Doubleday, Esq., F.L.S., Vice-presidents. A. H. Hassall, Esq., F.L.S., P. B. Ayres, M.D. and Edward Palmer, M.D., were elected new members of the Council in the room of J. F. Young, M.D., T. Sansom, Esq., A. L. S. and S. P. Woodward, Esq., A.L.S. Mr. J. Reynolds, and Mr. G. E. Dennes were respectively re-elected Treasurer and Secretary, and Mr. J. G. Mitchell, M.E.S. was elected Librarian.

January 2, 1846. — F. Barham, Esq., in the chair.

Donations to the Library were announced from Mr. H. C. Watson, Dr. Martius, Dr. Kirschleger and Mr. A. Gerard.

British plants had been received from Mr. H. C. Watson, Dr. Bossey, Dr. Bromfield, the Rev. H. L. Jenner, Mr. W. D. Biden, Mr. J. Ray, Mr. F. Barham, Mr. W. L. Notcutt, Mr. E. Lees, Mr. H. O. Stephens, Mr. G. H. K. Thwaites, Mr. W. Andrews, Mr. S. P. Woodward, Mr. Moore, Mr. J. D. Salmon, Mr. Freeman, Mr. G. Fitt, Dr. Harris, Mr. J. Storey, Mr. J. Tatham, Mr. Hawkins, Miss Beever and the Secretary. Foreign plants had been received from Dr. Kirschleger and Mr. T. Twining.

Read, "Further Observations on the Potato-murrain," by H. O. Stephens, Esq. (see *Phytol.* ii. 414). The paper was accompanied by some beautiful drawings.

*Further observations on the Potato-Murrain.** By HENRY OXLEY STEPHENS, Esq.

IN a paper on the potato-murrain read at a meeting of the Society, October 3rd, and published in the November 'Phytologist' (*Phytol.* ii. 330), I expressed an opinion that the Fungi found in the diseased tubers were to be considered rather as accidental accompaniments than the proximate cause of the disease, and that I considered it impossible that the *Arlotrogus* could be the cause of their decomposition because that Fungus was not invariably present, and that up to the period at which that communication was written, I had not succeeded in detecting it. Subsequent observations have convinced me

* Read before the Botanical Society of London, 2nd January, 1846.

that this inference was correct. The identical sample of potatoes which were then free from cryptogamic organisms, now certainly contain them. I now find the *Arlotrogus hydnosporus*, or at least a mucorine fungus according with the description of Montagne, excepting that in my specimens the spores appear tuberculated or granulated and not bristly, but this may possibly depend upon age. It inhabits the cavities of the cells, perfecting its spores within them, and I think its creeping filaments perforate the cell-walls. It is proper to mention that the same microscopic power has been used in all these observations. In last August, these potatoes, then clearly diseased, contained no fungus; now being farther advanced in decay they contain it in tolerable abundance. I therefore conclude the *Arlotrogus* is not the cause of the disease which had progressed materially in the tubers before any sign of cryptogamic life was discernible in them. I believe I am therefore justified in expressing my *confirmed* opinion that the potato-murrain, at least as far as the destruction of the tubers is concerned, is not produced through the agency of cryptogamic parasites.

These mucedinous fungi, when present, are very easily seen, and it is quite idle to assert the contrary. I am altogether at a loss to account for the statement of Mr. Phillips (I quote from a notice in the 'Pictorial Times,' not having seen the original essay), "That no insect or fungi can be perceived in the diseased tubers by any means the microscope affords." Either he could not have employed a sufficiently high power, or not being a mycologist he must have passed these minute organisms over without recognizing them; or what is quite possible, the sample of diseased potatoes examined by this gentleman happened to be free from them, and he concluded this was *invariably* the case. But making every allowance, so direct a contradiction to the observations of such investigators as Montagne, Berkeley, &c., ought not to have been hazarded on light grounds.

I am fully aware that filamentous mucedines are generally found in decaying vegetable matter, *e. g.* apples, &c., but am not so certain that they are *invariably* present; and to what extent they may be considered as the agents of decay, is a question yet to be solved. I doubt whether their presence in decaying fruits, &c., proves more than the simple fact, that decomposing vegetable matter affords a soil suitable for the nourishment of these cryptogamics.

HENRY OXLEY STEPHENS.

Old Market Street, Bristol,
December 16, 1845.

Silybum Marianum a biennial. By GEORGE LAWSON, Esq.

THE *Silybum Marianum*, *Gært.* (*Carduus Marianus*, *L.*), is given in the 'Edinburgh Catalogue' as an annual, while in 'Hooker's British Flora,' the period of duration is omitted. From what I have seen of the plant, I should at once set it down as a biennial. It grows at Momfieth, a village about six miles east of Dundee, Forfarshire, where I have frequently had opportunities of observing it, and *there* the plants are produced from the seed in one season, and flower and perfect seed during the succeeding summer. Generally a few of the plants produce flowers the same year in which they rise from the seed, but such plants assume a low, stunted and unhealthy appearance. Under cultivation, however, this plant may be made fully to develop itself, and to perfect flowers and seeds during the same season in which the seeds are committed to the soil; but this is the case with many biennials, and in a state of nature this plant is utterly incapable, as far as I have observed, of arriving fully at perfection in one season, and therefore I must consider it a biennial. In other situations, however, the case may be different. I only speak from what has come under my own notice.

GEO. LAWSON.

Hawkhill, Dundee,
December, 1845.

Occurrence of Salvia Verbenaca near Dundee. By G. LAWSON, Esq.

It is stated in Sir William Jackson Hooker's 'British Flora,' in regard to *Salvia Verbenaca*, that it is "in Scotland only found about Edinburgh." This statement is, however, scarcely correct, as the plant is also found near this place, growing with all appearance of being really indigenous. The situation where it is here found, to which I refer, is the Magdalen-yard Green, an open common at the west end of the town, on the margin of the Tay, to which many of our townspeople resort for amusement and recreation. Two or three years ago, extensive alterations and improvements were made upon the grounds, and in consequence of these the plant was reported to have been destroyed. During the past summer, however, I had the pleasure of *rediscovering* it growing on a dry sunny bank, in gravelly soil, a short space from the spot it formerly inhabited, and, although in a very public situation, where it was exposed to the merciless tread

of the multitude, and the ravages of children attracted by its beautiful flowers, still it bore a very healthy appearance. I may, however, remark that the specimens were not of very great height, the tallest not exceeding a foot and a half.

Should this interesting plant be a desideratum with any of your readers, I shall feel a pleasure in communicating specimens.

GEO. LAWSON.

Hawkhill, Dundee,
December, 1845.

Stray Thoughts on Botanical Rambles and Visits; suggested by Mr. Hewett Cottrell Watson's "Remarks on the usefulness of a Periodical devoted to British Botany." By G. LAWSON, Esq.

IN perusing Mr. Watson's "Remarks on the usefulness of a Periodical devoted to British Botany," which appeared in the January number of the 'Phytologist' (Phytol. ii. 379), I was somewhat surprised to notice the disrespect with which he regards the contributions which appear under the head of "rambles and visits," for I have all along considered contributions of such a character highly valuable, not the less from their being amusing and interesting than being instructive and highly beneficial to science, and always up till the date of the appearance of Mr. Watson's paper, I have been under the impression that such was the universal opinion of botanists on the point.

I am sorry to occupy any of your valuable space with remarks on this subject, and would have said not a word in regard to it; but when I consider that what Mr. Watson has stated may, if allowed to pass without observation, be the means of deterring many able contributors from transmitting you for record their valuable observations, which, perhaps, from circumstances could be put into no other feasible shape than a "ramble" or a "visit," I feel called upon to make a few remarks, and these tending to show that *all* the readers *do* not, or at least *ought* not to peruse what he is pleased to class amongst the "poorest contributions" with the same indignant spirit. I shall, however, be very brief, as I am fully aware that the pages of the 'Phytologist' might be occupied by matter which would prove much more interesting to the readers generally than the present.

The reason Mr. Watson urges for the exclusion of such contributions is, I admit, one of very great importance; but I really do not think that the end in view, viz., the rendering the 'Phytologist' "a

complete record and index of all that is done or discovered in British Botany," can possibly be gained by such means, for the very fact of these being excluded would show the 'Phytologist' *not* to be a *complete* record. If such articles *are* to be excluded, I am fully satisfied that many *doings* and *discoveries* would never be made known to the world, but remain, to all intents and purposes useless, in the pages of private note-books. For in a ramble many facts may be stated, and interesting facts, too, which might never be supposed worthy of a place in any journal in the shape of separate articles, and even published in such a form, I hesitate not to say, that in very many, if *not* in all cases, they would occupy much more space than if amalgamated in the form of a ramble. I can therefore see no reason whatever for the exclusion of RAMBLES from the pages of the 'Phytologist.'

The principal feature for which I love rambles, is the much useful information which through them is conveyed to the reader of the general appearance of vegetation in particular localities, for although a list of the rarer plants of a certain locality may be interesting, its interest must be greatly enhanced by a knowledge of the plants composing the greater portion of the vegetation of that locality, it being not exclusively by observations on rare, and what is generally meant by the term "interesting" plants, that science is benefitted.

But besides this, and a host of other pleas for botanical "rambles," there is the pleasure in reading a ramble, which to me, and I should think to every lover of Flora is very great, and ought to be taken into account. If there is a pleasure in botanizing, and few of the readers of the 'Phytologist' will deny the fact that there is, then there *must* be a pleasure in reading a ramble. By such we are carried in imagination to the scene of action — we gaze on the lovely flowers — we cull the rarities, and all without pains or exertion on our part, being all the while comfortably seated in our *studio*.

I cannot allow the present opportunity to pass without expressing my heartfelt gratitude to the many able gentlemen who have so liberally contributed "rambles" to the 'Phytologist,' for I consider the rambles to be amongst the most valuable articles, and I sincerely trust that some other means than the exclusion of that interesting portion of the contributions will be found for the completion of your ably-conducted Journal, as a full record of botanical discovery in the British Isles, and it is almost such already.

The only way in which the object in view can be properly accomplished is, I think, by the addition of a few pages sufficient to contain the additional matter. A very few additional pages would suffice,

and I cannot think for a moment that any of the readers would hesitate in giving a few additional pence for the carrying out of so desirable an object. If this is not done, but the "rambles" and "visits" excluded, the 'Phytologist' will lose much of its interest. It will then become a mere "matter-of-fact" record, similar in all respects to the diary or ledger of a man of business, and will not be perused with so much interest or be of the like service to science it is at present. It is important that *facts* be recorded not only in the pages of the 'Phytologist' but on the mind of every student of science, and this can only be done by a familiar narration, which is most easily got at in such a form as that referred to, viz., a "ramble" or a "visit."

I have long ere now conversed with several botanists on the subject, and have found *their* opinions of rambles to agree in every particular with my own.

Mr. Watson suggests as another means of adding to the space required for the admission of the additional matter "the easy and required process of pruning down those exuberant articles, whose purpose is little more than to say over again matters previously on record, and sufficiently well understood." I may, however, remark in regard to this, that I have very seldom, if ever, met with such articles in the pages of the 'Phytologist.' Indeed, I have not, as yet, read an article in it which *pruning* would not materially injure, and I am fully satisfied that the remedy here would be worse than the disease, for if "pruning" is resorted to, much information must necessarily be omitted. There is a decided difference betwixt *literary* and *scientific* periodicals: the articles for the former *may* be pruned, but it is dangerous to prune the latter.

I fear, however, I have already extended my notes too far, but hope the importance of the subject in hand, though not strictly speaking *botanical*, will plead my excuse for thus trespassing on your valuable pages. I mean no offence to Mr. Watson, and hope he will take my remarks kindly, for in such a spirit are they given.

GEO. LAWSON.

108, Hawkhill, Dundee,
January, 1846.

On the occurrence of Mimulus luteus in South Wales. By the REV.
W. T. BREE, M.A.

MR. LAWSON, in the January number of the 'Phytologist' (Phytol. ii. 389), records the fact of *Mimulus luteus* having been met with in several situations in Scotland "quite naturalized," and he adds, "it may be indigenous;" and he requests that those who may have met with the plant in other situations, would communicate the circumstance through the medium of the 'Phytologist.' I take the opportunity, therefore, of stating for the information of Mr Lawson and others who may be interested in the subject, that so long ago as the summer of 1824, I met with *Mimulus luteus* naturalized and thriving robustly on the boggy margin of a mountain rill, not more than a mile or two from Abergavenny (see Mag. Nat. Hist., Vol. v. p. 198). The plant was in flower, and attracted the eye at a distance by the profusion of its bright yellow blossoms, making a most showy appearance, far more so, indeed, than I had ever seen it do in a cultivated state. The place, in short, seemed to suit it. Not having the remotest idea that the plant was indigenous in that situation, or other than introduced by the hand of man, I did not think it worth while even to preserve specimens. It appears to me extremely improbable that a plant so conspicuous, if really indigenous, should have so long escaped the notice of botanists, or even of common observers. If truly a native, it would, I think, have been one of the oldest inhabitants of the garden, instead of being indebted to comparatively modern days for its introduction. Nevertheless, its occurrence in several distant localities favours, in some slight degree, its claims as a native. The plant near Abergavenny, I may add, so far as I have observed, appeared to be confined to one spot only, which, again, is another circumstance militating against the notion of its being truly indigenous.

W. T. BREE.

Allesley Rectory,
January 19, 1846.

Occurrence of Mimulus luteus near Stirling. By F. TOWNSEND, Esq.

You will oblige me by the insertion of the following in the next number of the 'Phytologist.'

I am happy to record another station in Scotland for *Mimulus luteus*, which plant I found in July, 1845, growing sparingly on the

banks of the Forth, rather less than a quarter of a mile above the bridge at Stirling. I did not pursue my course further up the river, or I might have met with other specimens. At the time of gathering the plant I supposed it to have escaped from a garden, probably carried down the river, and thence naturalized where I found it. But the additional stations given by Prof. Balfour and Mr. Lawson render the above worthy of note, tending to prove that *Mimulus luteus*, either will soon become generally naturalized, or has claims to be considered an indigenous genus. It appears that the plant is easily propagated, enduring the severest frosts, and requiring no particular soil, but a damp situation. Loudon gives the date of its introduction 1826, 'Bot. Reg. 1830.'

F. TOWNSEND.

Ilmington, January 5, 1846

On the occurrence of Mimulus luteus in Perthshire and Forfarshire.

By WILLIAM JACKSON, JUN., Esq.

IN the last number of the 'Phytologist' my friend Mr. Lawson has recorded the existence of *Mimulus luteus*, as being perfectly naturalized in two stations in Forfarshire. In corroboration of Mr. Lawson's statement, I may mention that it is now upwards of fifteen years since I remember first seeing the plant growing by the side of Invergowrie burn. My father tells me he recollects having found it growing to all appearance truly wild and at large, more than twenty-two years ago, in the same locality, and I believe it was known to some botanists a good many years previous to that date, and supposed to be a South American plant naturalized. At the above station the plant may be indigenous, as I am unable to procure any information of its being planted there by the hand of man, or of its escape from a garden. It may, however, have been washed down by the stream from some garden and deposited on its banks.

Last summer I found this showy plant growing luxuriantly and apparently wild, in Perthshire, occupying a considerable extent on the banks of the Tay, a little below the picturesque ruins of Kinclaven Castle, which stands at the junction of the rivers Tay and Islay, embowered amongst lovely woods and waters. At this part of the river the banks are beautifully clothed with gigantic trees, while the water runs smooth and placid over a pebbly bed. Such observations as Mr. Lawson's are extremely useful, as they tend, in a great measure,

to illustrate the history of numerous foreign plants, now entirely naturalized in our island, and which deserve as good a place in the British Flora as some others, such as *Saxifraga umbrosa*, which the Rev. W. T. Bree I think, has clearly shown to be of exotic origin (*Annals Nat. History*). A correspondent to Grove's '*Naturalist's Journal*,' published in 1832, mentions *Mimulus luteus* as being "naturalized in various places throughout the country," without specifying the stations; this is the more to be regretted, as a complete list of the stations where found growing would be extremely interesting, with the dates when first found recorded.

WILLIAM JACKSON, JUN.

46, Scouring burn, Dundee.

Note of a few plants growing on Helvellyn or in its vicinity.

By JAMES BACKHOUSE, JUN.

DURING a short tour among the lakes and mountains of Cumberland and Westmoreland, in the 7th month of last year, I left the inn at Patterdale with two companions and a guide, on a gloomy afternoon, to ascend Helvellyn. We took the course up Grisedale, and after a long, yet easy ascent, reached the foot of the "Striding Edge." Here the wind was so strong that we hesitated a little before determining to take this exposed and narrow ridge for our course, instead of the easier way of passing over the foot of Catchedicam and along the "Swirrel Edge." Yet as we learned from the guide that the former ridge was the best locality on the mountain for plants, we concluded to try it. We therefore ascended to the first point, which is the highest part of it. Here, under the shelter of the craggy rocks, we rested awhile, and enjoyed the fine prospect beneath and around. Many hundred feet below us, on one side was the beautiful valley of Grisedale, watered by a mountain stream, and backed by the towering rocks of St. Sunday, Crag and Fairfield.

On the other side, in a dark hollow far beneath our feet, lay the Red Tarn, hemmed in by the precipices of the Swirrell Edge and the sharply-peaked Catchedicam, behind which Skiddaw reared his head in the distance. This Tarn is more than 2400 feet above the level of the sea; its surface was agitated by the violence of the wind, which roared among the bleak and barren rocks over which we had to pass

before reaching the summit of Helvellyn. In proceeding, the first plant of interest which attracted my attention was *Saxifraga stellaris*, scattered in solitary tufts among the crevices of the rock. In Teesdale this plant is almost entirely confined, so far as I have seen, to boggy places, not on rocks. Further on I noticed *Sedum Rhodiola* and *Oxyria reniformis*, the latter in tolerable abundance. On the rocks towards the western extremity of the ridge I found some fine tufts of *Cerastium alpinum*, a plant frequently met with in Scotland, but not, that I know of, recorded in any *botanical* work as a native of England. I also saw a *Hieracium* of dwarf habit, with large downy buds, to which I should like to call the attention of those who may hereafter visit this spot. Besides these, *Salix herbacea* in seed, was the only plant I observed worth mentioning. When we reached the summit of the mountain we were completely enveloped with fog and cloud, so that we could see nothing but the upper part of the deep gorges and chasms in the precipitous cliffs with which the top of the mountain is faced. We therefore made our way against wind and rain, down to Grisedale Tarn, where I left my companions and the guide, and crossing the hollow between Seat Sandal and Fairfield, took the course of a mountain stream, which ultimately guided me to the Keswick road at a point between five and six miles from the summit of Helvellyn. With another five miles' walk I reached Ambleside in safety about 10 o'clock.

I may perhaps here mention a few other plants which I noticed in this district.

Ranunculus hederaceus with remarkably large flowers, probably *R. hederaceus* β . *grandiflorus* of Babington, near the head of Coniston Lake. This may be a common mountain plant, but it was new to me.

Symphytum tuberosum, near Foxhow, the residence of the lamented Dr. Arnold. This I think was the true *tuberosum*; it produced solitary stems, rarely exceeding two feet in height, with flowers of a dull pale yellow, and leaves scarcely, if at all, decurrent.

Teesdalia nudicaulis, among the tumbled rocks on the face of Loughrigg Fell.

Hymenophyllum Wilsoni, of unusually large size at Dungeon Gill. The longest frond I measured exceeded $4\frac{1}{2}$ inches in length; some of the fronds also were strongly forked.

Pyrola minor, near Stock Gill Force.

Geranium Phæum, foot of Loughrigg Fell.

Isoetes lacustris, and *Lobelia Dortmanna*, in Crummock Lake.

JAS. BACKHOUSE, JUN.

York, 14th of 1st Month, 1846.

Notice of 'A Flora of Tunbridge Wells, being a list of indigenous Plants within a Radius of Fifteen Miles round that Place. By EDWARD JENNER, A.L.S.

THIS Flora appears to have been founded upon the original '*Flora Tunbrigensis*' of the late Mr. T. F. Forster, but is by no means an idle copy of that work. Most of the species and stations have been verified afresh, while many others are added to those previously recorded in the work of Mr. Forster. The additions seem partly attributable to the more extended space over which the present Flora is made to range; but several of the more recently discovered plants and localities are within the more narrow circle of the earlier work. The volume is of portable size, neatly got up, and well calculated to be serviceable to botanical collectors who may visit Tunbridge or its neighbourhood; besides supplying a very full list of species to those who may have occasion to make use of such a list at a distance. The discovery of *Carex montana*, the most interesting novelty of the Flora, has been already recorded in the '*Phytologist*' (ii. 289).

C.

Notices of North of England Plants. By W. BORRER, Esq., F.R.S.

INSTIGATED by a perusal of Mr. G. S. Gibson's '*Notes*' in the '*Phytologist*' of the present month, (Phytol. ii. 373), I send a few notices, chiefly of my own want of success in some recent botanical researches in the same parts of England.

At Helmsley, May 28, 1844, I was more fortunate than Mr. Gibson. The weather was fine, and James Spence, the gardener who showed Mr. Woods "the hole from which the last specimen of *Cypripedium* was dug in May, 1834" (Comp. to Bot. Mag. i. 192), guided me up the beautiful valley of Birkdale to the same spot, where was now coming up, weakly and with no sign of flowering, the only plant, as he stated, that he had found since Mr. Woods' visit. He had shown it in 1843 to a botanist, whom he had permitted to cut off the flowering stem, but, mindful of Mr. Woods' threat of an Act of Parliament to hang him, he had not allowed the root to be disturbed. *Helleborus viridis* (as remarked by Mr. Woods) and *Actæa spicata* abound in the wood. The old man who so carefully guards the Orchidæ on the Rievaulx terrace from the sythe, by marking them with sticks, told me that he had once found a single specimen of *Cypripedium*.

In two gardens at Keswick I saw this beautiful plant, thriving and in full flower, early in June. The roots were supposed to have been brought from a wood in Legberthwaite; but understanding the species to be now lost there, and having seen it in Yorkshire and gathered it in Durham, I did not visit the locality. I subsequently searched a reported station in Fairfield, among débris of rocks, between Rydal-head and the Dove Crag, but, I acknowledge, without expectation of finding it.

In Teesdale, August, 1845, I had the pleasure of seeing *Hieracium Lapeyrousii* (Bab.), and the other species named by Mr. Gibson, and *H. inuloides* in addition, but sought in vain for *Arenaria uliginosa*, although the younger Mr. Backhouse, the actual discoverer, I believe, had kindly given me a most accurate direction to the station. It is said that the place was visited by another collector subsequently to the discovery, and I fear the plant may have been extirpated. Yet, surely, it may be expected to re-appear. *Arenaria verna* abounds there. *Juncus triglumis* grows by the stream in one place; and some of the good Teesdale plants, *Gentiana verna*, *Kobresia caricina*, *Carex capillaris*, are in plenty near at hand.

Poa Parnellii occurs at Caldron Snout, and at the confluence of the Greta, the highest and the lowest points that I visited of the course of the Tees, and in various places between.

Rumex aquaticus seems common in Teesdale. In some wet meadows it is a troublesome weed.

Guided by "Kit Dent" of Cotherstone, early in June, 1842, I visited the spot by Balderdale where he had long before discovered *Saxifraga Hirculus*. It is in some boggy rills in the Cotherstone Fells, which, uniting, form a little gully, and fall, after a very short course, into the Balder, a mile or two above the highest farm-house by the valley, and perhaps about the same distance below the other station by the junction of the Black Beck. The place is well marked by a solitary old mountain ash, the only tree in the neighbourhood, a very little way above the gully, and on the opposite side of the river. The plant was not in flower, of course. I did not go to the Black Beck.

I am glad to learn that *Woodsia ilvensis* still exists at the Falcon Clints. I saw it there in 1842. I have not visited the spot since.

I could not find *Equisetum umbrosum* at Winch Bridge. *E. variegatum* was there, and the common *E. arvense*.

Epilobium virgatum grows near Barnard Castle, by the road to Greta Bridge, and by the Gormire Pool near Thirsk. By this pool a

youth who accompanied me rediscovered *Lysimachia thyrsiflora*, which, as I was told at York, had been sought for there in vain since Mr. Woods observed it in 1835. We found it in very small quantity: a remarkable circumstance of a plant that usually spreads so extensively by root. I saw it and the *Scheuchzeria* in plenty in Leckby Carr, in May, 1844. For the latter, however, I had a long search, finding it at last about the middle of the bog, where it would be scarcely accessible except in a particularly dry season.

Myriophyllum alternifolium grows in Gormire, and *Potamogeton heterophyllus* in abundance, and another *Potamogeton*, about which I am in doubt. It has very long leaves and fruit-stalks, and the point of the leaf is somewhat hooded; whence at the time of gathering it I supposed it *P. prælongus*. I met with it again, again accompanied by the *Myriophyllum*, in the mountain pool in Place Fell, by Ulleswater, called the Angle Tarn. I saw the true *P. prælongus* in Windermere, near the Ferry Inn, over against Bowness. I sought twice, June and July, 1844, for *P. longifolius* in Rydal Water, Mr. John Ball having given me a barren specimen so named, of his own gathering in that place. I found a great quantity of *P. heterophyllus*; and upon subsequent examination, with Mr. Babington, Mr. Ball's specimen proved to be, in fact, of the same species. I am not aware that the true *P. longifolius* (Mr. Ball's Irish plant) has been observed in England.

I have not seen the specimens of Mr. Ball's *Linaria* from "the rocks of Coniston Water," of which Mr. Babington says, "If the seeds I have with the specimens are correctly referrible to the plant (I have no ripe capsules), it is a very distinct species, and as far as I have yet seen quite new." It had been supposed *L. italica*. I found on a rock by the road on the lake side, in quite a wild place, near Nibsthwaite, a variety of *L. repens* with a white unstriped flower, which I saw afterwards near Newby-bridge, on a dwarf wall facing a lawn by the road to Stavely, and in gardens at Stavely and at Ambleside. I have seen it also among the common *L. repens*, in Normandy, near Rouen. I have not, indeed, examined the seeds, my specimens being in an early state of flowering; but I have no doubt that I refer it correctly to *L. repens*. There seems reason to suppose the Truro and Southampton "*L. Bauhinii*," or *L. italica*, a hybrid between *L. repens* and *L. vulgaris*, such as Dr. Bromfield has found in the Isle of Wight. I believe that Mr. Babington now thinks the Irish plant different from all these, and a specimen that he has given me looks so. *L. purpurea* grows in some quantity on the ruins at Barnard Castle: I have seen

it escaped occasionally in the south of England. *L. Cymbalaria* has indeed a very wild appearance in many parts of the country. It is become very common in Sussex since I brought it in my pocket, when a boy, from Westminster Bridge, the first time I ever met with it. I have seen it looking very native-like near Boxgrove, not, as usual, on a wall, but on a hedge-bank by the road-side. I know not whether it continues there.

I can scarcely doubt that *Impatiens Noli-me-tangere* is truly indigenous in Westmoreland. It is not confined to Stock Gill (where I saw it in 1810, and where, as Mr. Gibson observes, it still grows), but far up the Scandale Beck, and separated from Stock Gill by the ridge running down from the Snaka Moss, and in various places by Windermere, into which lake the waters of both these streams, after uniting with the Rothay and the Brathay, are ultimately discharged.

Spiræa salicifolia has long been recorded as a native of the shores of Windermere; yet I regard it as most probably introduced, like *Rosa alpina*, of which there are many bushes along the road through the Bellegrange woods on the western shore. The *Spiræa* grows also in a hedge by the road from Penrith to Wigton, not far from Hutton Hall. I doubt much whether it is truly indigenous anywhere in Britain. It was quite naturalized near Dunkeld, as long ago as 1808; but we learned that it had been planted. It has been planted too near Bala, North Wales, in various places along the road towards Corwen, where a stranger, without inquiry, might well believe it a native. I have not seen it by the Dee below Bala, where Mr. Woods observed it many years ago; but I should suppose it very likely to have been carried down from some garden by the river.

Meconopsis cambrica occurs in many places in the lake district: I should suppose it indigenous.

Juncus filiformis grows by Thirlemere, on the west shore of the upper lake, and in a meadow at its head, as well as in the long-known place near Keswick.

Miss Wright showed me *Rosa gracilis* (*Woods*) in Mr. Woods' original place, by the road over Whinlatter. The rose in "Howrey Field," Keswick, which has been taken for *R. cinnamomea*, is the American *R. lucida*. There are two plants of it in the hedge near the junction of the river Greta with the Derwent, and they are spreading by their creeping roots. I saw a quantity of the common double-flowered *R. cinnamomea* in a hedge by the road from Bowness to Kendal,—planted, of course. By the Crummock Lake, by the road from Buttermere to Scale Hill, I found one bush of a rose which Mr.

Woods is inclined to agree with me in referring to *R. hibernica*, although its leaves are smooth.

Rumex alpinus grows by the road-side about a mile from Mungrisedale towards Greystoke Park, accompanied by *Imperatoria ostruthium*, in an adjoining meadow. A cottage is near at hand. Mr. Wright mentioned another place where "he had seen the *Rumex* in large quantity," about the vestiges of a Roman camp. The *Imperatoria* has a more wild appearance by Thirlemere, and by the stream that issues from it, near the head of the Vale of St. John, than I have seen it present elsewhere, either in England or in Scotland.

I had a walk of some hours in vain search for *Staphylea pinnata*, about Finsthwaite, near Newby Bridge, (misprinted *Kensthwaite*, in Bab. Man. Bot.).

Senecio sarracenicus still grows by the river at Newby Bridge; where Mr. Woods observed it; also near Hutton Hall (by a stream?) separated by a hedge-row from the Penrith road.

Alchemilla alpina is common in many of the mountains. Large specimens occur in Gatesgarth Pass, and larger in Wastdale Screes; but, excepting in size, I saw no approach to *A. conjuncta*.

Hieracium inuloides is not uncommon in the lake-district, growing mostly on the borders of the lakes or by streams in the valleys. I found it however occasionally about mountain rills,—I recollect particularly near Hayes Water; and in one place, near Fox How, in a dry wood. *H. sabaudum* occurs perhaps as commonly as *H. boreale* in these parts. These two grow together by the Tees about Barnard Castle, and look different. *H. prenanthoides* I have seen nowhere in South Britain but by the river Allen, near Ridley Hall, Northumberland, where it was shown me by Mr. John Thompson, the discoverer of *Carex irrigua*. He showed me this *Carex* and *C. pauciflora* growing in profusion on the Muckle Moss, and beginning to flower, May 31, 1844; also, near the same place, *Crepis succisæfolia*, which I have since seen at Whelpington, Northumberland; about the High Force, in Teesdale; and in Heseldine Gill, Yorkshire, near the station of *Saxifraga umbrosa*.

Charles Wright, of Keswick, is an excellent guide, intelligent, indefatigably active and intimately acquainted with the mountains: but with regard to the stations of rare plants discovered by him I was particularly unfortunate, although I took care to engage him to guide me to all of them in which I felt an interest, except *Pyrola uniflora* and *Allium Schœnoprassum*. The *Pyrola* "he had found" at Bardsea, near Ulverstone, and he gave me a very particular direction to the

spot; the *Allium* at Dalton in Furness, where there is also other authority for its occurrence. I found neither of them. Of *Epimedium alpinum* I have already spoken in the 'Phytologist,' (Phytol. ii. 2), as well as of *Saxifraga rotundifolia*, found by Miss Wright; and the Rev. W. T. Bree has communicated additional information respecting the latter (Id. 65).

Mr. Wright "had seen" *Asarum europæum* at Troutbeck, "in a spot which he knew well;" a *Saxifraga* different from *S. hypnoides*, and which he supposed to be *S. cæspitosa* of Hudson, or, at least, *S. moschata* of Withering, in Kirkstone Pass; another *Saxifraga*, allied to *S. Aizoon*, wild on rocks at Crosthwaite, Westmoreland, for which he showed me, as the same species, *S. Cotyledon*, planted on a wall by Troutbeck Bridge. We visited each of these places in vain. *Saxifraga Geum* has been reported to be an English plant on the sole authority of Mr. Wright, who "has discovered it at the head of the Duddon in Bowfell," and he gave me a specimen "gathered there by himself." He conducted me, however, over the lofty pass of Oar (pronounced Ewar) Gap, in Bowfell, to some gills of Esk, not Duddon, in a deep valley below,

"A lowly vale, and yet uplifted high
Among the mountains,"

as the places in one or other of which he had found the plant, acknowledging that, having never been there before but in thick cloud, he had erroneously supposed the waters to fall thence into Devon, the head of which, the source of the Cockley Beck, we found in a bog on the other side of a low green ridge; between the mountains Crinkle-crags and Hard Knot, I believe. I found the walk from Seathwaite in Borrodale to this ridge and back a laborious one, in a bright hot day; the more so perhaps as I returned without the *Saxifraga*: but the mountain-views were glorious. "The colour and the form" of Great Gable, as seen at sunset that June evening, in coming from the Esk-hause, between Great End and Glaramara, are scarcely to be forgotten.

I have not been in the vale of Duddon; but, in a walk from Conistone Water-head, by the way of the Old Man to Fell Foot in Langdale, I visited several of the feeders of that river, and their sources, some in the Conistone Fells, above Seathwaite Tarn, and some on either side of the Wrynose Pass, without finding any plant of much interest.

Mr. Wright told me I should find *Saxifraga Geum* wild at "The Station," on the west side of Windermere, and all along the road from The Station to Newby Bridge. It completely covers some rocks in

the garden below The Station, but no one can doubt its having been planted there. I observed one patch among stones by the lake, a little way out of the gardens, by the road towards Ambleside; but not a plant of it could I find in a drive to and from Newby Bridge. *Sedum rupestre*, possibly wild, grows above the edge of the lake not far northward from the Ferry. *Carex stricta* (Good.) grows behind the Ferry Inn.

The wall-tops about the towns and hamlets of this district are very commonly covered with various plants, chiefly Saxifrages and Sedums, Sax. Geum and umbrosa occasionally among them; but neither of these have I seen in any place where I could regard it as indigenous, except the latter in its recorded station, Heselden Gill, Yorkshire.

I saw *Pyrola secunda* in two of Wright's places, Wallow Crag by Keswick, and Fisher-place Gill, above Thrispot; and he brought it to me down from some rocks in the Vale of St. John.

Of *Geranium nodosum* Miss Wright had no specimen to show. I sent her a garden one, in 1844, that she might know the plant. Her father "had known two patches of this species by Thirlmere (or Leatheswater), one of which had been removed to the garden at Dale Head," a house hard by the lake. Of the other he knew not the fate, but it also had disappeared. He showed me "where they formerly grew." It was on the stony bushy margin of the lake, not on any land now cultivated. The plant in the garden, "brought from the lake-side," proved to be *G. angulatum* of Curtis (Bot. Mag. t. 203); a plant of which the native country is still, I believe, unknown, and which so nearly approaches *G. sylvaticum*, that it might almost be supposed a large smooth variety of that species. Some other not very common garden flowers were there: but Wright "was certain" that the *Geranium* was the very root that had grown by the lake. *G. sylvaticum* is so abundant through the lake district as to be, in early summer, the great ornament of the meadows and thickets. Its flowers are extremely variable in size, being sometimes scarcely so large as those of *G. pyrenaicum*, and sometimes almost rivalling those of *G. pratense*. They vary much, too, in their bluer or redder tinge; and on one plant, between Rydal and Fox How, I found them of a pale pinkish hue, like those of *G. angulatum*.

I found *G. lancastriense* among the sand-hills towards the north end of Walney island, in moderate plenty, in immense beds of *G. sanguineum*, of which it is a mere variety, differing only in the pale flowers. It is not, in its native place, at all more prostrate than the red-flowered plants, which vary much, both in intensity of colour and in size of the flower. The sandy shores in various places in the north,

at Fleetwood, for example, at Embleton, Northumberland, and at Hartley Pans, are richly adorned with this beautiful species. Mr. Storey, of Newcastle, gave me a white-flowered specimen from the last-named place. The same gentleman showed me there the only known station of *Anchusa officinalis*, a spot of fifty paces by fifteen, and near the same place, *Ruppia rostellata*; as well as *Eryngium campestre* still abounding at Gateshead, although much of the ground it formerly occupied is now built over. I did not visit the station of this plant near South Shields.

I did not go to Workington to look for *Geranium striatum*; neither my experience elsewhere, nor Mr. Woods' statement in the 'Companion to the Botanical Magazine,' affording much encouragement. I have seen a specimen of this *Geranium*, gathered by the Rev. Mr. Billingsley, in a foot-path through a wood above the Wye, near English Bicknor. He saw but one plant. I have visited the place and hunted in vain. This species has established itself in the avenue to Horneck Castle, near Penzance, and in a neighbouring lane. It was shown to me there by the Rev. H. Penneck.

Miss Wright showed me *Hieracium aurantiacum* in a meadow in the Vale of Newlands. It was too near to a garden, and *Aconitum Lycoctonum* was growing close by, also on the outside of the garden-fence. The *Hieracium* "grew formerly in another meadow, farther from the house, which is now a corn-field" (*Miss W.*), and "on one of the islands of Derwent Water, before it was converted into its present state," that of a pleasure-ground, (*Mr. W.*)

Lysimachia ciliata I found, by a direction kindly sent me by the late Mr. W. Backhouse, immediately before his death, in the place where he discovered it, between Penrith and Wigton. It is by the road-side, near Sebergham. The plant forms one large patch. Mr. Wright had "found it in 1832," in a slate-quarry in Warnell Fells, about a mile from Mr. Backhouse's place. The "one specimen which he gathered, and preserved a long while in his pocket-book," was unfortunately lost. "The *Andromeda* was growing near it." I visited the quarry, with Mr. Wright, but it had been extended on the side "where he had seen the plant," which was consequently no longer there. There never could have been a bog for the *Andromeda*. Mr. W. introduced me to an inhabitant, of respectable appearance, who was "*beyond convinced*" that he had seen the *Lysimachia* in a large wood by the river Caldew, at some distance from Sebergham, in more places than one. He accompanied me into the wood, but his recollection of the spots was not sufficient to find any one of them.

He promised to write to me when he had found the plant again, which he expressed a very sanguine expectation of doing; but I have not heard from him. Mr. Backhouse observed some differences in the habit and mode of growth between a Sebergham plant removed to his garden, and another of American origin, as he believed, that he had in cultivation. Mr. Wilson showed me what seems a variety of this species, with broader leaves and larger flowers, quite naturalized, together with an American Aster (by Orford Hall, I think it was), near Warrington; and in a spot adjoining, *Onoclea sensibilis* was thriving over a considerable space of boggy ground, planted as a nursery with young poplars. He told me that a botanical garden formerly existed there.

Borago orientalis grows in some quantity in a wood by the roadside at Portiuscale, near Keswick. Mr. Wright says that it grew there before the adjoining house and garden were in existence; and that there is another station of the plant, which I did not visit, about half a mile from this. He had not learned the name of the plant.

I did not go to look for *Meum Athamanticum*, but Miss Wright sent me a recent specimen.

Having never been in the Vale of Duddon, I, of course, have not seen *Euphorbia Cyparissias* in Ulpha; nor have I seen a specimen. To return once more into Northumberland, I gathered the plant so called from the wall at Hulne Abbey in Alnwick Park, under the kind guidance of Mr. Embleton, in August, 1845. It was quite out of flower, and even the capsules had fallen. I cannot speak positively, but I strongly suspect that it is *E. Esula* in a starved state, and not the genuine *E. Cyparissias*. I have the plant now in my garden, and hope to decide the question next summer.

Mr. Embleton took me to the place where *Maianthemum bifolium* had been found at Howick. The plant has been completely extirpated. The spot was close by Earl Grey's garden. I have since visited Kenwood (or Caen Wood), not in Northumberland, but Lord Mansfield's seat near Hampstead, where the plant exists in two large patches; one of them a circular one of seven paces in diameter, in a part of the park which is said to have been never cleared from the aboriginal forest. Opinion will vary as to whether it is indigenous or not. It is desirable that the ancient Lancashire stations should be explored.

Mr. Embleton showed me *Ligusticum scoticum* among the stones on the shore at Dunstanburgh Castle.

By the bridge over the Alne, going from Alnwick towards Emble-

ton, I gathered what I take for *Barbarea arcuata*. It seems to me far less satisfactorily distinct from *B. vulgaris* than *B. stricta*, which is so common about York and in other parts of Yorkshire, and which I first noticed by the side of the railway near Rotherham, and in many places going thence to Halifax, late in May, 1842.

Obligingly guided by Mr. Arthur Trevelyan, I visited the one plant of *Linnæa borealis* discovered many years ago by Miss Trevelyan, at Catcherside, some four miles from Wallington Hall. It is a wide patch, in a plantation of Scotch firs, said to have been brought, about eighty years ago, from Norway. *Pyrola minor* grows with it; and *Sedum villosum* on the neighbouring moor.

I regretted want of time to visit the pool in which Mr. Winch discovered *his* *Nuphar pumila*. Mr. Trevelyan pointed out the direction in which it lies, some miles over the moor from Catcherside, and showed me the plant in a pond at Wallington, to which it had been brought. I have had it long in my own garden, from a plant originally sent from Northumberland (by Mr. Winch, I believe) to the Oxford Botanic Garden. It is not the true *N. pumila*. I have regarded it as a small variety of *N. lutea*, but it deserves further attention. It may possibly be *N. tenella*, of which Reichenbach gives a character under *N. sericea*, in his '*Plantæ Criticæ*' (cent. 2, p. 10) and '*Flora Excursoria*' (p. 14).

I regretted still more that I had not time to go to Wall Town for *Allium Schoenoprasum*. Mr. Thompson has some idea that there are two species in that neighbourhood, confounded under this name. Some living plants that he has kindly sent me, have the upright habit of the chives of our gardens, but the leaves are rough as in *A. sibiricum*.

If I had not the satisfaction of verifying Mr. Wright's discoveries, I had no better success in hunting for Hudson's lost plants, his *Saxifraga cæspitosa*, *Hieracium dubium* and *H. Auricula*. For want of time and fine weather I did not ascend Loughrigg Fell, nor Wansfell; but I left scarcely any other mountain "above Ambleside" unvisited. A thorough investigation of those mountains, however, would require weeks, or months, and Hudson's plants, and many a plant as yet unobserved besides, may perhaps reward the industry of future visitants. I flattered myself that I had got a clew to the Saxifrage, when I observed *S. hirta* on a rock in the chapel-yard at Rydal, and was shown the same on a planted rock in the garden at Rydal Hall, by the chapel-clerk, George Bankes, who is also gardener to Mrs. Arnold, at Fox How, and assured by him that it had been planted in both places

by himself, and that he had originally brought it many years ago from the neighbouring fells. He was not aware of the rarity of the plant, not having distinguished it from *S. hypnoides*, and he could not tell precisely where he had found it; but he had no recollection of bringing any Saxifrage from any place but a ruined ancient wall, that traverses the breast of the mountain, below the Rydal Pikes, for a mile or more. I did not fail to search the wall thoroughly, and that twice, through its whole length: but I found no Saxifrage of this group, either on the wall or on the neighbouring rocks, but *S. hypnoides*, which is common in this and other branches of Fairfield, and varies much in size of flower and width of petals. *S. platypetala* itself, which grows in plenty in the eastern precipices of Fairfield, is perhaps but a variety. In justice to my respectable informant, I must declare my confidence in his sincere belief that he brought the *S. hirta* from a wild place in the mountains, although I had not the good fortune to find it. In several excursions in Fairfield I traversed almost the whole of the main ridge, from the Red Scree above Kirkstone to the opposite extremity above Grisedale, and all its southern branches, distinguished as the Scandale, Rydal, and Grasmere Fells. I clambered too among the eastern precipices in a few points, and saw, I believe, all the scarcer plants found there by modern botanists, except *Saxifraga oppositifolia*, which, by the way, I found in plenty on Ingleborough; but, except a moss or two, added nothing new. *Hieracia* do not abound there. The most common are, perhaps, varieties, some more, some less glaucous, of *H. Schmidtii* of Tausch. The glaucous and spotted-leaved "*H. murorum*," so common in some parts of Wales, which has been mistaken for *H. maculatum* (*Smith*), I saw in the mountains, I think only in the Rydal Pikes, and there sparingly. Another spotted-leaved plant, *H. rigidum*, *γ. pictum* (*Bab. Man. Bot.*), I did not observe here, but Mr. Thompson showed it me in Tynedale, and I saw it and *H. Lawsoni* in some gills of the Great End mountain towards Wastdale. *H. Lawsoni* was also very fine on rocks due west of the inn at the head of Kirkstone Pass. Stockgill is rich in *Hieracia* of the *murorum* group. Among them is one which I fancy may be *H. nudicaule* of Edmondston. I gathered the same by the Findhorn, and by some other Highland streams, in 1810; but I have never satisfied myself about it. I hope now to study it under cultivation. [See *Phytol.* ii. 184, Ed.]

I see no reason to doubt that Hudson's "*Dalehead, non longe a Grasmere in Westmorelandia*," is, as Mr. Otley suggested to me, above Easedale, between the High Raise and Steel Fell mountains,

where are some small pools almost filled up, one or other of which is the Dalehead Tarn of some of the maps, and whence the waters fall into Cumberland, North, and into Westmoreland, South. I ascended to this place both from Wythburn and from Grasmere, and sought for "H. Auricula" as assiduously as my time in the two walks admitted. I left ample space, however, uninvestigated, and great choice of gills and dry rocks, grassy turf and bog, in which the plant may yet be found again. I had the good fortune to meet with a few plants of *H. alpinum* at Langdale Pikes. They were in leaf only; but I cannot doubt the species, although, at the time, I hoped I had got "*H. Auricula*." I have no idea that the Dale-head mountain above Newlands can be Hudson's place; although Wright told me that a specimen labelled as one or the other of Hudson's *Hieracia*, from Dale Head, "*near Keswick*," from the late Bishop Goodenough's collection, exists in the museum of some institution at Carlisle. I walked from the Gatesgarth Pass, over that mountain and the neighbouring Hindscorth, into the Vale of Newlands, but found nothing of much interest.

There are some interesting brambles among the lakes; but I will say nothing more about them than that the form which abounds in the Rydal Woods, not exactly to the exclusion of all its congeners, is not the *Rubus Bellardi* (*Weihe*), as Turner's specimen in the Smithian herbarium had led me to suspect.

I believe I brought home two of the grasses recently distinguished by Parnell: *Poa subcompressa*, from a bridge-wall at Greta Bridge; and *Poa polynoda*, from rocks at the Colwith Force, Langdale, near Ambleside.

In mosses I was as fortunate as one so slightly acquainted with the tribe could expect to be. I will mention a few of the best that I met with.

Edipodium Griffithianum. On the higher mountains, Bowfell, Fairfield, High Raise, &c., on soil in crevices of the rocks, not rare.

Zygodon Mougeotii, B. & S. In dry chasms of rocks in many places: barren.

Grimmia torta and *spiralis*. Rocks due west of the house at the head of Kirkstone Pass; Wallow Crag, by Keswick; Dove Crag, in Fairfield: barren.

Orthotrichum rupicola. Stone walls near Mardale Green, Hawes water.

Doniana. Stone walls, everywhere among the mountains.

Tortula vinealis, Brid. (*Zygotrichia cylindrica*, Taylor). Ireby, Cumberland; Barnard Castle.

Encalypta rhytocarpha. Ingleborough, with *E. ciliata*, on limestone near the summit.

Bartramia calcarea, B. & S. Rivaulx, and Heselden Gill, Yorkshire; moor at Catcherside, Northumberland; with male flowers: finely in fruit near the High Force Inn, Teesdale, where Mr. Spruce previously found it.

Hypnum Crista-castrensis. Above Troutbeck Park, by the side of the road to Kirkstone; Dove Crag, Fairfield; among birch-trees by the side of Riddingdale, Haweswater: barren.

Bryum albicans. Helvellyn and elsewhere, in rills: barren.

—— *julaceum*. Common in mountain rills: fruiting abundantly in Kirkstone Pass, and in Wythburn Beck.

—— *Zierii*. Red Scree; Rydal Pikes; and elsewhere, in wet crevices: I found capsules only in Wallow Crag, Keswick.

—— *alpinum*. Common in the mountains, but usually barren: with capsules in Wastdale Scree; and in Smelt-house Gill, at the foot of Cawsey Pike.

—— *uliginosum*, B. & S. In a branch of the Wythburn Beck, in High Raise.

—— *acuminatum*, B. & S. Eastern precipices of Fairfield, between the summit and Rydal Head; Conistone Fells, exact spot not noted.

—— *torquescens*, B. & S. Rock by Gormire, Yorkshire, very sparingly.

—— *intermedium*, B. & S. Wall at Cotherstone, Teesdale.

—— *mnioides*, Wils. Helvellyn, (I forget the situation, having gathered it as *B. punctatum*); with *Cinclidium*, in the bog by Malham Tarn, where I understand Mr. Wilson has also gathered it.

—— *Duvallii*. B. & S.? Barren from a gill in Glaramara.

I brought home also two or three other barren mosses, apparently *Brya*, which friends, more learned than myself, have not positively determined.

Of lichens I saw but few of much interest, although the leafy ones were very luxuriant in many places. Mrs. Stanger gave me *Peltidea aphthosa*, with fine apothecia, just gathered by herself near Grange Bridge, Borrowdale; and I found it in the same state on mossy rocks on the west side of Thirlmere, in June, 1844. *Stereocaulon denuatum* is common in the mountains, but rare in fruit. I found a few

specimens in that state near the summit of Rydal Pikes. I did not meet with *S. paschale*, nor *S. corallinum*. *S. Cereolus* I found, very fine, on a wall by Wastwater. *Lecanora upsaliensis* spread among the thin herbage of some of the mountain-tops, Grasmere Fell, for example, and Dale Head above Newlands.

I observed *Verrucaria lævigata*, very fine, in the bed of the Tees at Barnard Castle, and one patch of *V. isidoides* (*Pertusaria* of Hooker in Brit. Flor.) at the High Force. I believe this lichen has heretofore been found only by Miss Hutchins, who discovered it near Bantry. I was sorry to learn from Mr. Robertson that the station of *Endocarpon euplacum* (*Ach.*) near Newcastle, the only known one in Britain, is destroyed, a quay, I think he said, now occupying the place.

I will now bring my rambling and egotistical gossip to a conclusion; wishing to future visitants more success in finding the rare plants of these interesting districts, and as much enjoyment as I had in hunting for them.

W. BORRER.

Henfield, January 15, 1846.

P. S. Feb. 10, 1846.—Mr. Wilson pronounces my supposed *Bryum Duvallii*, the *B. Ludwigii* of Schwaegrichen, a moss previously found by Mr. W. in Clova and in Wales.

Mr. Mitten finds among some mosses that I had put unexamined into his hands *Racomitrium protensum* of Braun (*B. & S.*). I gathered it from dry rocks by the path from the inn at Scale Hill, Cumberland, to "the station," where it forms wide patches. I found no fruit.

I take this opportunity of correcting a few inaccuracies either of my pen or of the press.

P. 428, l. 4, *Read*, and accompanied by *Imperatoria*.

P. 429.—Immediately before the quotation from Wordsworth—Oar Gap *should be* Ore Gap. The place is so named from nodules of iron-ore scattered on the surface of the ground. In line 3, after the quotation, Devon *should be* Duddon.

P. 432.—Under *Borago orientalis*, *Portiuscale should be* Portin-scale.

P. 436.—Among the stations of the *Hypnum*, Riddingdale *should be* Riggindale.

W. B.

Notice of a 'Flora of Shetland; comprehending a list of the Flowering and Cryptogamic Plants of the Shetland Isles, with remarks on their Topography, Geology and Climate. By THOMAS EDMONSTON, Professor of Botany in the Andersonian University of Glasgow, 1845.'

CIRCUMSTANCES, unimportant to the readers of the 'Phytologist,' interfered with an earlier notice of the 'Flora of Shetland,' published by Mr. Edmonston when about to quit the shores of Britain, on an important botanical expedition, which is likely to occupy him for several years (Phytol. ii. 185). It seems that Mr. E. is a Shetland "*rara avis*" in his botanical acquirements, since we are told in the Introduction to his volume, that he "has never heard of any native who had studied the science," saving himself. The ground was new and all his own; but novelty has its disadvantages along with its pleasures. The botanist who writes a Flora of a cluster of islets, whereon dwelleth no second votary of the floral goddess, is likely to find few purchasers, and still fewer readers of his book. He must look for the latter, at least, among those who occupy themselves with the geographical relations of plants. And, indeed, from the position of the Shetland Isles, like a connecting step between Great Britain and the more arctic islands, subject to the crown of Denmark, a list of their plants will possess more geographical interest than usually attaches to a local Flora for a very limited tract. Until their floral productions were investigated by Mr. Edmondston, these "hundred isles" remained almost a *terra incognita* in a botanical view; and hence, however small its usefulness to the non-botanical islanders, the 'Flora of Shetland' is nevertheless a publication of some importance in the literature of Botany.

The volume includes a list of all the species (fungi excepted) which have been detected in the isles by the zealous author of the work. The phanerogamic portion of the list comprises about three hundred and thirty species. Adding thirteen Filices, four species of Equisetum and three of Lycopodium, we have an islet Flora of three hundred and fifty species, exclusive of the strictly cellular plants. Although the author intimates that the group of isles has not been fully examined, we believe this numerical result may be accepted as a probable approximation to their true floral census, which is not likely to exceed four hundred species, even should it hereafter be raised to that number. The data afforded by the neighbouring islands, both southward and northward of Shetland, appear to justify this supposi-

tion. Messrs. Babington and Balfour detected three hundred and thirty-eight species in the outer Hebrides, during a short tour in those more southerly isles, at the most favourable season of the year for ascertaining their plants. The number reported for the Orkney Isles, indeed, exceeds four hundred; but the list is brought under that number by deducting many species which have been reported on authority botanically insufficient, and which are very unlikely to be found so far north. The Flora of the Faroe Isles, as reported by Mr. Trevelyan, includes only two hundred and eighty species, while that of Iceland embraces three hundred and seventy species. Thus there seems fair reason to believe that Mr. Edmondston's botanical industry and research have supplied us with a creditably copious and pretty complete list of Shetland plants, although some few of the species may have been left out. But doubtless a goodly number of those enumerated in his volume, more especially the agricultural weeds, owe their existence in Shetland to the operations and importations of farmers or others.

The most novel feature of the work can scarcely be accounted a recommendation, being one which makes troublesome any reference to its contents, to ascertain the presence or absence of certain species. This is a new scheme of classification, imperfectly explained, and considerably at variance from our preconceived ideas on that debatable subject. Several of our author's orders are exactly identical with those which are generally or universally adopted by systematists, by reason of the close and well marked similarities of the plants included in them, such, for instance, as the Gramineæ and Cyperaceæ, or the Cruciferae and Umbellatae. But other orders bear very much the look of arbitrary assemblages of things having little in common, and nothing whereby to distinguish them satisfactorily from other groups. One of these assemblages, designated "*Speciosæ*," includes the following genera: *Anagallis*, *Armeria*, *Statice*, *Primula*, *Menyanthes*, *Erythræa*, *Azalea*, *Jasione*, *Campanula*, *Caprifolium*, *Gentiana*, *Trientalis*—an odd sort of assemblage, and more odd still in this (which is the author's own) arranged series of the genera. We have another order, under the name of "*Diandriæ*," which includes *Pinguicula*, *Utricularia* and *Veronica*. Another combines *Scabiosa*, *Plantago*, *Asperula*, *Galium*, *Littorella*. The leading idea of the scheme would seem to run upon some dovetailing together of the Linnean and Jussieuan principles of classification—the sexual and natural systems. This has frequently been attempted by young botanists, or by older heads to which advancing age had not brought wisdom; and the attempt has always proved a failure.

The author does not record many localities in detail, resting content with general indications; and in a work little likely to be much used within the isles, this course was judicious enough. Equally so is the omission of specific characters and descriptions, excepting in some few cases where there seemed need for them, as in describing a new species, for, of course, like other very local discoverers, our young author must find a novelty or two to name and describe. A mountain form (usually so deemed) of *Plantago maritima* is "raised to the rank of a species," and the following characters are given to distinguish the new species from the plant of the sea coast:—

P. maritima.—Leaves erect, narrow lanceolate, smooth; spikes cylindrical.

P. setacea.—Leaves lying flat on the ground, cylindrical or semi-cylindrical; spikes globular.

Another "new species" is "*Laminaria Cloustonii* (Edmons. MSS.);" but, while the first to impose the new name upon the plant, our author is not here the first to propose the new species. In alluding to the fancy for making or naming new species, sparingly exercised, we should also record an instance of personal forbearance under this head, shown by Mr. Edmondston, in his retaining as a variety only, the plant formerly figured in the '*Phytologist*' (i. 497), erroneously, as the true or typical form of the Linnean *Cerastium latifolium*; and afterwards distributed as a new species, under the manuscript name of *C. nigrescens*, Edmonds. (*Phytol.* ii. 96). Some little uncertainty, however, seems even still to attend this plant. No available distinction has been found between the plant of Shetland and the Linnean *C. latifolium* of the Highland mountains; and yet its peculiarly broad and obtuse leaves, deeply tinged with purple, afford a decided first-sight or physiognomical difference, which is even more pronounced in some examples raised from seeds of it in the neighbourhood of London. Besides this dubious *Cerastium*, there is only one other species peculiar to Shetland, when contrasted against other parts of Britain, namely, *Arenaria norvegica*, *Gunn.*—an inhabitant of Norway, as indicated by the specific name.

The geographical notices introductory to the list of plants, and remarks scattered through the list itself, are deserving of attention. And on the whole, though not free from some of the defects of haste and youthful inexperience, the '*Flora of Shetland*' is a creditable evidence to the author's ability and industry of research.

Notes on some British Specimens distributed by the Botanical Society of London, in 1846. By HEWETT C. WATSON, Esq.

In the 'Phytologist' for February of last year, the editor obliged me by printing some explanations about certain new or otherwise interesting British plants, then distributed by the Botanical Society. Perhaps I may be allowed the same privilege again, as there appears no other channel so suitable for recording the information which cannot be conveyed by labels. Unfortunately, there are very few examples of the two first species in the following list, so that the plants will still remain desiderata with almost all of the members.

1.—*Vaccinium macrocarpum* (Ait.)—This elegant plant was discovered in August last, by Dr. Bidwell, and should it prove to be truly a native of Britain, the fact will be important and unexpected in geographical Botany. The locality in which it was found, is that of Soughton bog, two miles and a half from Mold, by the road to Flint. The bog is stated to be of small size, and close to the road. Dr. Bidwell's inquiries failed to elicit any evidence towards showing that the plant had been designedly planted in this station. Hitherto the species has been known as a native only of North America, but it is occasionally cultivated in English Gardens, either for its fruit, or as an ornament around ponds of water. In general appearance it resembles our *Vaccinium Oxycoccus*, but is a much larger and more showy plant.

2.—*Cerastium strictum* (Linn.).—Mr. Andrews discovered this plant last autumn, on Great Arran Isle, Galway. The examples are labelled by the discoverer "*Cerastium arvense* var. *strictum*," and they certainly approach very near to some forms of *C. arvense*, with which many other good botanists now unite the *C. strictum*.

3.—*Cirsium setosum* (Bieb.).—Twenty specimens of this recent addition to the Scottish Flora, were obligingly sent for the Society by its original discoverer in Britain, Dr. Dewar. This is one of the intermediate species which connect the genera *Carduus* and *Serratula*. It is nearly allied to *Carduus* (*Cnicus* or *Cirsium*) *arvensis*.

4.—*Galium Vaillantii* (De C.).—The Society is indebted to G. S. Gibson, Esq., the discoverer of this *Galium* in England, for the specimens distributed. Mr. Gibson's experiments in raising this plant from seeds, equally as further observation of the wild examples, confirm him in the belief that it is quite distinct from *G. Aparine*, of which it has been deemed a variety. It seems, however, that *G. spurium* (said to have been found in Shetland by George Don) must be

united with *G. Vaillantii*. Steudel adopts the name of *G. agreste* (Wallr.), for the two united into one species (Phytol. i. 1129).

5.—*Luzula congesta* (Sm.).—This is a very common plant in Britain; but Mr. Bentall having good grounds for believing that large forms of *L. campestris* are frequently mistaken for it, examples of the true *congesta*, collected by Mr. Bentall, are enclosed in each parcel sent out. The correction of errors, by the distribution of properly labelled examples, may be held one of the most useful offices of a Botanical Society (see Phytol. ii. 168).

6.—“*Hieracium pulmonarium?*” (Smith’s Herb.).—The *Hieracium pulmonarium* of Smith, has been a puzzling species to botanists, and is yet insufficiently understood. It has usually been accounted a variety of *H. murorum* by those who refused to receive it as a true species, while in the ‘Manual of British Botany,’ Babington quotes it as synonymous with the *H. diaphanum* of Fries, and gives *H. Lawsoni* as a variety of the same species. The examples now distributed are from my own garden. They are unquestionably the same species as those in Smith’s herbarium, interrogatively labelled “*H. pulmonarium?*” To those specimens Smith alludes in the three last lines of his account of the species in the ‘English Flora;’ but in the herbarium (contrary to the statement in his printed work) they are mentioned to be garden examples. Curiously enough, however, these examples of *H. pulmonarium* from my own garden, are certainly descendants from three roots of *H. nigrescens* (Willd.), which were brought from Ben Aulder, in 1841. Indeed, three or four of the specimens actually came from those still living roots, while the others were raised from seeds produced on them in 1843 and 1844. As the *H. nigrescens* is usually deemed a variety of *H. alpinum*, while *H. pulmonarium* has been often considered a variety of *H. murorum*, this assertion about their identity will be received with some doubt, and reasonably so. In expectation of this scepticism, I will defer further explanations on the subject to a separate paper on these and allied species, which I have been carefully watching under cultivation. Meantime, I would refer to remarks on them already printed in the ‘Phytologist,’ from Mr. Babington and myself (see Phytol. i. 804, 865, 1139).

7.—*Enanthe pimpinelloides* (Linn.), *Lachenalii* (Gmel.), and *silifolia* (Bieb.).—These plants have been abundantly written about in the ‘Phytologist’ and elsewhere. They will, as a series, be much better illustrated by the specimens now distributing, than was done last year. Those of *Lachenalii* and *silifolia*, collected by the Rev.

A. Bloxam, are well dried and characteristic examples of the plants, including roots, at the stage of flowering. But the tubers (of *Lachenalii* especially) are so brittle, that many may be broken off before the specimens reach the hands of members. Unfortunately, the roots were broken short off in nearly all the specimens sent by Mr. Lees; but as some of them were advanced in fruit, they show one character which was wanting in the better-dried specimens from Mr. Bloxam. For the wild examples of *pimpinelloides* the Society was indebted solely to Mr. Lees. Though in a sad condition as respects pressure and drying, they come very opportunely to be compared with those of the other two species. I added some specimens from my garden, in order to show, at the same time, the broad radical leaf of the winter season, and the callous base of the fruit at the stage (before maturity) where it is most conspicuous. Taken together, the specimens in the earlier parcels of this year will sufficiently illustrate all three species, but the later sent parcels may probably have less complete examples. I will hope that Dr. Bromfield may be induced to dry a quantity of *pimpinelloides*, which is plentiful in the Isle of Wight; because, by so good and careful a botanist, the specimens would doubtless be well selected and well dried.

8.—*Primula vulgaris* and its varieties.—These are examples of the plants which were recorded in the 'Phytologist' for July last, as having been all raised from seeds of one variety of *P. vulgaris*. I dried a number of the flowers and leaves, and divided the whole into ten sets, calculated to show the range of variation. Only half-a-dozen sets could be spared for the Society, and of course, every variety could not be included in any single set. One pretty complete series has been sent to the Society's rooms in Bedford Street. In connexion with these specimens, I would beg to call attention to the necessity of preserving examples of the parent plants, as well as of the varieties produced, in all cases where similar experiments are made for scientific purposes. Inexact expressions, like "seeds of the red cowslip," are indifferent substitutes for the physical illustrations placed within reach of after examination (Pytol. ii. 217).

9.—The fine series of Irish Saxifrages from Mr. Andrews, will be appreciated by the members. Though the range of variation in the leaves of *Saxifraga Geum* and *S. umbrosa* is very wide, the different varieties run so insensibly into each other, that it becomes impossible to separate them by rigid lines. Two varieties are distributed under the name of *S. Geum*, one with the crenatures obtuse, the other having them so acute as to be almost dentate in some examples; yet

these two forms, so dissimilar at the opposite extremities of their series, were scarce distinguishable in some of the intermediate examples. Indeed, at this time I have a living plant before me, on which both the acute and the obtuse crenatures are found very clearly shown on different leaves. It is highly probable that *S. hirsuta* (*Linn.*) must be sunk into the grade of a variety; the Irish species of the section remaining only two, *Geum* and *umbrosa*, and even these two running almost together in *hirsuta* and *elegans*.

10.—*Glyceria plicata* ("Fries") and *Glyceria fluitans* (Br.).—Mr. Moore kindly supplied examples of these two species, lately distinguished as such, from Hampstead. The *G. plicata* is likely to occur in many counties, though less common than the *G. fluitans*, from which it does not appear to have been hitherto distinguished, even as a variety, by the botanists of Britain. They are certainly very similar in most respects; and if I have ever seen *G. plicata* in a living state, it has been passed by, as only *G. fluitans*. All the specimens in my own herbarium belong to the latter species solely. Unfortunately, these grasses were not included in several of the parcels sent out in January and February.

Though other interesting species or varieties are to be found among the plants distributing this year from the Society, they do not seem to call for any particular notice, having been already recorded in the 'London Catalogue,' or in my former paper on the Society's distribution of last year (*Phytol.* ii. 43).

HEWETT C. WATSON.

Thames Ditton,
February, 1846.

Thoughts on the progressive development of species. By WILLIAM WILSON, Esq.

IN reference to Mr. Watson's remarks on this subject, I think that too much has been conceded to the transitionists. To admit the possibility of a variety assuming the essential properties of a central species, or an acquired tendency to perpetuate its own likeness preponderating over that paternity which would induce it to return to the form of the central species, seems to me very like the surrender of two important principles, without which the debate cannot be profitably carried on.

One of these principles is, that a species must possess certain permanent characters by which it may be known : unless this is assumed, our idea of a species becomes a mere metaphysical abstraction, having no foundation in nature. The other principle is one laid down by Mr. Watson, viz., that the changes effected in plants are simply the natural results of certain conditions to which they are subjected : a principle which admits, if it does not absolutely require, that when the changed plant is no longer exposed to distorting influences, it will naturally and immediately begin to revert to the original form. It seems to be a groundless figment to suppose that the abnormal characters of the variety could be perpetuated, apart from those conditions, on the principle of "like producing like," which has no meaning if we do not confine it to some *law* impressed on organized matter, a law which becomes unintelligible or rather nullified by the supposition that a new inherent tendency is imparted. It has indeed yet to be proved that a variety does acquire an idiosyncrasy of such a permanent and independent character that no conditions will alter it. The probability is, that a susceptibility of change must remain in all plants which have been once effected by previous influences, greater even than what may be supposed to reside in unchanged plants, unless we assume that the very same conditions will invariably produce the very same results in every individual subjected to their action : a position which can scarcely be established from any experiments hitherto made. Mr. Watson says it cannot be disproved that there exist permanent varieties which possess the essential characters of a species. It is not at all necessary to disprove it ; and is it not enough to show its improbability ? If we admit the possibility of such a permanent change, we virtually adopt the views of the transitionists, without their having brought out anything in the shape of facts to require our assent.

I believe it is Spence who remarks that when we say "we are inclined to think so and so," we say much more than we mean — are more candid than discreet. The views of the transitionists appear to be very much the result of *temperament*, unless we suppose that they have been subjected to certain conditions which have brought them into an unhealthy state, unfitting them for making sound conclusions from given premises. There are varieties of *men* as well as of *plants*, though I never yet heard of human monsters producing their like (a race of Calibans) in unchangeable perpetuity ; but with Mr. Watson I should be very unwilling to think the advocates for transition so far gone in absurdity as to be incapable of hearing reason. To t^h

who hold that doctrine, I would say, that if their views are right, we cannot determine what a species is, unless we define it to be a mere temporary and transitory modification of matter. The adoption of such a definition may lead to conclusions of a very sceptical character concerning matter, as to its origin and self-motive properties. It is surely the most rational course to assume that an intelligent, creative power, in benevolence to rational creatures, would not so constitute existing races of animals and plants as to elude recognition after a certain lapse of time, and thus impress a character of fluctuation and uncertainty upon all the works of creation, even upon man himself as a *species*, and by a lamentable consequence, upon his intellect also, rendering it (I may say) impossible to know anything, according to the doctrine of ancient sceptics, whose tenets seem only to be revived in another shape by the transitionists.

Before I close this paper, I will add a few remarks on *Festuca loliacea*, about which I have formed (perhaps erroneous) conclusions at variance with those of Mr. Watson. Several years ago, I visited a meadow on the banks of the Weaver above Northwich, where *F. pratensis* and *F. loliacea* were growing together in profusion. At that time I had serious misgivings about their specific diversity, and fully expected to find intermediate links connecting the two forms into one species. Since then I have also had similar doubts concerning *F. pratensis* and *F. elatior*. This year and last year I have paid particular attention to *F. loliacea*, growing by itself near my present residence, and am led to think that it possesses claims to be considered a species. It flowers later here than *F. pratensis*, and I have omitted to preserve growing specimens of the latter for comparison. It is not my present intention to contend for *F. loliacea*, but only to request that further observation and experiment may be employed before the question is treated as settled. With Sir W. J. Hooker, I am disposed to consider *F. pratensis* more nearly related to *elatior* than to *liiacea*, and would direct attention to the long *outer* valve of the calyx of the latter, also to the numerous florets of the spikelet and to the geniculate character of the culm. Perhaps it might not be quite absurd to ask how *Lolium pratense* is to be permanently distinguished from *Festuca loliacea* if the latter be considered as a mere variety, and I would direct attention to the remarks of Sir J. E. Smith, in 'Eng. Flora,' concerning *Lolium* as a genus.

W. WILSON.

Orford Mount, August 2, 1845.

P.S.—The paper now sent has been hitherto kept back, in the hope that I should ere this have had an opportunity of reading the work referred to by Mr Watson. My namesake's queries (Phytol. ii. 377) addressed to him on the subject of hybrids, induces me to submit what I have written to the readers of the 'Phytologist.' My own impression is, that true hybrids are not capable of reproducing their kind. Professor Henslow has stated that "Kœlreuter ascertained that all the plants raised between *Digitalis purpurea* and *D. Thapsi*, by fertilizing the ovules of either by the pollen of the other, were constantly prolific; but then he also ascertained that *D. Thapsi* itself, when cultivated by him, after five generations assumed all the characters of *purpurea*. He consequently rightly inferred that *D. Thapsi* was to be considered no otherwise than as a Spanish variety of the more common form of the species." If other reported examples of fertile hybrids were as rigorously scrutinized, I believe that the same result would be obtained. Meanwhile it may be safely assumed, in reply to Mr. E. S. Wilson's queries, that we shall never be able to determine what is or is not a hybrid, until we shall have first ascertained what is really a species. In the present state of our knowledge, it appears to be the safest rule to pronounce a "fertile hybrid" a variety; and I confess I do not see the utility of such experiments as those instituted by Mr. Watson and recommended by Mr. E. S. Wilson, unless the permanency of a form under every variety of cultivation be assumed as *prima facie* evidence of a species on the one hand; and on the other, every deviation from the form of a parent stock, which is continued in the progeny of a variety, be considered conclusive evidence that the variety is not a hybrid. What other test can be applied?

January 17, 1846.

*An Outline of the Flora of the Neighbourhood of Godalming, in the County of Surrey; with brief Notices of the Geological Features of the District.** By J. D. SALMON, Esq.

IN bringing the Flora of Godalming and its neighbourhood before the notice of botanists, it is necessary that the limits of the district should be clearly defined, and that the geological features which present themselves should be noticed: for the outline of the latter I have availed myself principally of Dr. Mantell's Memoir in the 'History of Surrey.'

* Read before the Botanical Society of London, February 6, 1846.

Extent and Boundary. — The tract of country about to be illustrated is comprised within a square, the sides of which are about eight miles in extent, having Godalming for the centre; every portion of the district is therefore within a moderate walk of the town.

The chalk ridge, well known as the Hog's Back, running east and west, has been taken in part as the northern boundary; a narrow slip of London clay on the north side of this range, is, however, included within the district, as affording an additional variety of soil. From the abrupt termination of the Hog's Back at Guildford, the northern boundary is continued along to Merrow Downs: from thence the eastern boundary passes by St. Martha's Chapel, and crossing the valley of Chilworth by the powder-mills, it skirts Blackheath to Shumeley Green, is continued across the Wey and Arun canal to the junction of the Cranley and Horsham turnpike-roads, and follows the latter to Pain's Hill.

The southern boundary is taken hence in a westerly direction through the wealden clay, immediately at the base of the lofty range of hills commencing at Hascomb Beech, and terminating at Bowler Green near Hindhead. From this point the western boundary is formed by an imaginary line through Cosford crossing Thursley Common to Elstead, and continued thence over Crooksbury and Puttenham Commons by Hampton Lodge, passing over the Hog's Back near Shoeland Farm to the commencement of the northern boundary.

Geological Features of the District. — In noticing these, I commence with the northern limit, which is a termination of the London clay resting upon the chalk. I am not aware that any portion of the plastic clay is to be found within the limits: the Bagshot sand, which is so conspicuous, does not approach nearer than Romping Downs, about two miles distant. The principal feature is the beautiful chalk ridge called the Hog's Back, which scarcely exceeds half a mile in breadth. "This remarkable ridge of the North Downs extends from Guildford to a point about two miles from Farnham, and has evidently been produced by an upthrow of the chalk, and the breaking off of the southern portion of the curve. The inclined position of the remaining side of the flexure is seen at the western extremity of a large chalk-pit, between Guildford and Puttenham, where the strata dip towards the north at an angle of about 30° . The upper beds are very white, with courses of the usual dark flint nodules; and a remarkable feature in this quarry is the distinctness with which the chalk is divided into masses approaching to a rhomboidal figure, by seams

oblique to the stratification; the angles of the portion thus formed standing out in the face of the cliff, like splinters in the shattered fracture of a crystal."

Descending its southern side we meet with a narrow stratum of fire-stone, which "forms a slight projection along the foot of the Hog's Back; the gale, a corresponding depression along its whole length," varying in breadth from a few hundred yards to a quarter of a mile, towards the eastward, opposite Littleton. Having passed this tract, we approach the principal stratum of the district, which is a portion of "one of the most extensive surfaces of the Shanklin sand in England. This sand rises rapidly in many places to a considerable elevation: at St. Martha's Chapel it equals or out-tops the chalk, though less than a mile from it horizontally." This character extends over a great portion of the district, presenting numerous acclivities, the most conspicuous of which are St. Martha's Chapel, already mentioned, Chinchurst Hill, heights around Godalming, Highdown Heath, Hascomb Beech, and the ridge of hills stretching thence by Burgate, Hambledon, Barnacle and Wormley towards Hindhead, where an elevation of upwards of 900 feet above the level of the sea is attained.

The heights in the immediate vicinity of Godalming offer excellent sections of the Shanklin sand. Holloway Hill affords a good example of the strata, which are composed of loose sandy materials, and abound in large concretions of chert and of Burgate-stone, "a conglomerate of quartz-grains and pebbles, held together by a strong calcareous cement, which is hard and sparry, and much used for the purpose of building."

"The ferruginous concretions termed *curstone* are abundant on the Witley and Thursley Commons, and from being so compact as to ring under the hammer, are called *clinkers* by the quarrymen. This stone sometimes occurs in plates or flakes, more than a quarter of an inch in thickness, and curved so as to resemble portions of consecutive layers of petrified wood." It furnishes an excellent road-material, and gives that remarkable reddish hue to those roads which are Macadamized with this stone. Fragments of brown hæmatite, a kind of iron ore, occur in this district. There were anciently several iron-furnaces, of which the only memorials are four large ponds, called the Hammer Ponds.

The only remaining portion of the district to be noticed is that forming the southern boundary, and which is occupied by the clay formation of the northern limit of the thickly wooded weald of Surrey.

The General Aspect of the District. — In many parts it is highly diversified with hill and vale. The town of Godalming stands on the high road to Portsmouth, and is pleasantly situated in a beautiful valley bordered by lofty hills, the sides of which, for the most part, are richly clothed with ample foliage, rendering the surrounding scenery highly picturesque. This character extends more or less through the adjoining valleys towards Guildford, adding much beauty to the general scenery; and from the different eminences a series of splendid views are to be obtained. The Hog's Back commands a most extensive prospect. The view towards the southward presents a magnificent landscape; in the foreground, the undulating ridges of the various hills, interspersed with beautiful winding valleys, presenting to the vision a lovely and rural scene. Further on, the eye wanders over the whole extent of the weald of Sussex, rich in foliage, and only arrested to the eastward by the bold and mountainous ridge of Leith Hill, which rises to an elevation of nearly 1,000 feet above the level of the sea. This splendid panorama is backed by the lofty outline of the South Downs, which border the English Channel and extend into Hampshire. From other points the views are equally extensive, penetrating into the adjoining counties.

The extensive heaths, "though not unpicturesque, are wild and barren in their aspect, destitute of wood;" yet there are several large ponds, formed by the embankments across the valleys, the margins of which will afford much pleasure and gratification to the ardent botanist. "The surface is, in fact, to this hour, nearly such as it may be conceived to have been when first uncovered by the departure of the sea." The whole district is intersected with delightful valleys, through which run several rivulets, that flow into the Wey from various sources, amongst which is one that is almost rendered classical by the delightful author of *Selborne*. This, meeting the Blackdown stream at Headley, is joined by the Alton and Farnham branch, at Tilford-bridge, where they form a considerable stream. From this point the Wey proceeds in an eastwardly direction by Elstead &c., receiving in its course several small streams from the neighbourhood of Thursley and Witley, one of which takes its rise in the Devil's Punchbowl, from which source flows a delicious stream, as clear as crystal. The river, after passing by Godalming, from whence it is navigable by the addition of a canal, runs through a long line of pleasant meadows to Guildford, and in its progress receives the tribute of two additional streams, the Arun canal and the Tillingbourne, which add much to its importance; it ultimately falls into the Thames near Weybridge.

According to Mr. Stevenson, "the waters of the Wey are of much less fertilizing quality than other streams in Surrey. This is attributed to the sandy country through which the Wey flows in the beginning of its course, and to the large quantities of sand which, after every heavy shower, are washed into the river from the steep hills near Godalming."

Localities of Plants. — From the diversity of soil included in the foregoing sketch, it is evident that many of our rarer plants may be expected to be met with. The Flora of the district will be better elucidated under the three following divisions.

The first division comprises the chalk and adjoining strata of London clay and gault, forming a large portion of the northern boundary. This district is rich in Orchidaceæ and other calcareous plants. The extensive quarries at Compton and Wanborough, will afford a rich treat to the admirer of this beautiful and interesting tribe of plants. *Orchis pyramidalis*, *Gymnadenia Conopsea*, *Listera ovata*, *Aceras anthropophora* and *Herminium Monorchis* may be found in this locality in the greatest profusion; *Ophrys apifera* and *O. muscifera* more sparingly.

The following interesting plants are found in this part of the district. On the face of the quarries, *Arabis hirsuta*; on the sloping *débris*, *Reseda lutea*, *Viola hirta*, *Rhamnus catharticus*, *Anthyllis Vulneraria*, *Hippocrepis comosa*, *Onobrychis sativa*, *Poterium Sanguisorba*, *Asperula cynanchica*, *Phyteuma orbiculare*, *Thesium linophyllum* and *Juniperus communis*, in abundance. *Gentiana Amarella* equally so upon the level surface, as is the case with *Carduus acaulis* and *Carlina vulgaris*; in the same situation *Chlora perfoliata* is occasionally met with. On the ridge, *Taxus baccata* is abundant, many of the trees denoting a good old age. *Cineraria campestris* has been found on a down towards the New Inn. *Monotropa Hypopitys* in some seasons is plentiful under the beech trees in a plantation overhanging the Compton quarry; in other seasons scarcely a plant is to be seen. Upon the lands forming the sloping portions of the Hog's Back, the following plants are generally distributed. *Pastinaca sativa*, *Torilis nodosa*, *Tragopogon pratensis*, *Picris hieracioides*, *Campanula hybrida*, *Linaria spuria*, *L. Elatine* and *L. minor*, *Calamintha Acinos*, *Galeopsis Ladanum* and *Euphorbia exigua*. *Pyrus Aria* cannot fail to attract attention by the snow-white under surface of the leaves, which are rendered very conspicuous by the slightest breeze of wind. *Clematis Vitalba* trails over all the fences, in which also *Viburnum Lantana* and *Ligustrum vulgare* form a prominent feature

upon divers portions of the chalk ridge. Several interesting plants are to be met with in an old discontinued chalk-quarry at the back of Losely Park. In addition to the several species of Orchidaceæ before enumerated, *Scabiosa Columbaria*, *Helminthia echioides* and *Campanula glomerata* abound; and in the field adjoining, I have found *Petroselinum segetum*. In the woods at the foot of the chalk, principally upon the gale, *Silene pratensis*, *Senecio tenuifolius*, *Primula veris*, var. *elatior*, *Daphne Laureola* and *Habenaria bifolia*; and in an arable field upon the sand adjoining *Veronica Buxbaumii* plentifully. Prior's wood will afford many an interesting plant, amongst which may be noticed *Aquilegia vulgaris* (sometimes with white flowers), *Orobancha tuberosus* and *Serratula tinctoria*.

The chalk-quarries round Guildford will amply repay investigation, and are rich in calcareous plants: in addition to those of the Compton and Wanborough stations will be found *Cichorium Intybus*, growing in the greatest profusion near St. Catherine's Hill; *Allium vineale* is located in one spot on the Stoke road; *Chenopodium olidum* will be found at the foot of an old wall in Quarry-street. *Isatis tinctoria* grows in the greatest profusion, principally from the fissures on the perpendicular face of the chalk in the Shalford quarry; here also will be found *Reseda Luteola*; and towards St. Martha's Chapel *Brachypodium pinnatum* occurs in a disused chalk-pit.

In this neighbourhood Mr. Mill has recorded *Fumaria parviflora* and *Bupleurum rotundifolium*, (*Phytol.* i. 40).

The central or great division is that which is occupied by the cultivated portions of the Shanklin sand, in which will be found the following rare or local plants. *Smyrniololus Olusatrum*, by the side of the Shalford road, opposite the park-paling. *Dianthus plumarius*, in the greatest profusion on an old wall in Shalford-street, and on the wall of Westbrook Park. *Saponaria officinalis* in a hedge-bank near St. Martha's Chapel. *Corydalis claviculata*, sparingly on St. Martha's Hill, amongst the trees. This delicate plant is abundant in a withy-bed below Perrydean field (Thorncombe-street), also in a wet coppice at Hambledon Heath. Mr. Mill (*Phytol.* i. 41) records *Listera Nidus-avis* as growing "in a heathy wood between Guildford and Martha's Chapel." *Hyoscyamus niger*, by the road-side against Stone-bridge wharf, by no means a common plant. *Impatiens fulva*, by the sides of the Tillingbourne at Chilworth, this beautiful exotic is naturalized, growing in the greatest profusion, and is equally abundant by the sides of the Wey to its junction with the Thames. The river-sides and adjoining meadows offer a rich treat. The occurrence of *Stellaria*

glauca in marshy meadows at the foot of St. Catherine's Hill, of *Cuscuta europæa* in an osier-holt by the side of the Wey a little above Guildford, and of *Lepidium sativum* and *Barbarea præcox*, upon the banks of the river, have been already recorded by Mr. Mill (*Phytol.* i. 41 and 64). *Nasturtium sylvestre* is found by the river-side against Unstead-bridge, and in an adjoining meadow *Scabiosa succisa*, which also occurs towards Hurtmore Bottom, and near Mungrove. *Chrysosplenium alternifolium*, intermixed with *C. oppositifolium*, on a wet hedge-bank near the bridge. There are several other stations for this beautiful plant, as the alder-car on Wood Farm, the Withy-beds, in the Deanery meadows, &c. *Medicago maculata* grows on the towing-path near Catteshall-bridge, a situation in which I am unable to account for its appearance. In the ditches in the common meadows will be found *Cenanthe crocata*, *Alisma Plantago*, *Sagittaria sagittifolia*, *Butomus umbellatus*, and several species of *Potamogeton*, as *densus*, *pusillus*, *pectinatus*, *gramineus*, *perfoliatus*; and in that portion known as Salgaston, *Cardamine amara* and *Menyanthes trifoliata*, which also occurs in a meadow higher up the river, and at Bom-moors, Compton. The boggy parts of Hurtmore Bottom will amply repay the labour of investigation. Here several of the marsh plants will be found, among others, *Thalictrum flavum*, *Ribes nigrum*, *Angelica sylvestris*, *Samolus Valerandi*, *Triglochin palustre*, *Scirpus sylvaticus*, and several *Carices*. *Gagea lutea* is recorded in the 'Botanist's Guide' as growing in a "meadow near Godalming." I have not been able to verify this information.

The woods surrounding Godalming are rich in botanical rarities. *Euonymus europæus*, *Cornus sanguinea*, *Campanula Trachelium*, *Veronica montana*, *Lamium Galeobdolon* and *Ruscus aculeatus* are common. *Cardamine impatiens* is abundant for the first two or three years after the clearing of the copsewood. *Turritis glabra* is sparingly found in the coppices and hedge-rows. The declivities of the woods with south and west aspects afford the rare *Carex depauperata*; the only other station for this plant is Charlton, in Kent. On Frith Hill, *Lepidium campestre*, *Dianthus Armeria*, *Astragalus glycyphyllos*, *Sedum Telephium* and *Marrubium vulgare* are plentiful. In the corn-fields at the foot will be found *Thlaspi arvense*, *Sisymbrium Sophia* and *Agrostis Spica-venti*.

Upon the tops of the old walls in and about the town several plants have established themselves. *Corydalis lutea* grows luxuriantly between Meadrow and Farncomb, and sparingly in other situations. *Sedum album* towards Crown pits, with *S. reflexum*, *Saxifraga tridac-*

tylites, *Centranthus ruber* and *Hieracium murorum*. *Erigeron acris* against the Vicarage, also *Linaria Cymbalaria*; this beautiful little plant is located in many additional situations.

Many interesting plants are distributed over the central portion of the district. *Lepidium Smithii* sparingly upon Hascomb road-side, opposite the second mile-stone. *Erysimum cheiranthoides* in several corn-fields, principally in the direction of Unstead. *Cerastium aquaticum* in wet situations against Spring Place. *Silene anglica*, abundant in Perrydean-field, Enton fields, &c. *Hypericum montanum* and *Geranium lucidum* upon most of the hedge-banks; the former in great abundance in the direction of Crown-pits. *Rhamnus Frangula*, Spring Place, an alder-car on Hambledon Heath; abundant in a wood near Compton, as stated by Mr. Mill (*Phytol.* i. 41). *Potentilla argentea*, this beautiful plant is by no means rare, and will be found upon the slopes near Milden's wood, also occupying various other situations on the tops of old walls and on hedge-banks. A fine tree of *Pyrus communis* occurs in a thorny state in a fence upon Hasted Farm. *Pyrus Aucuparia* is plentiful in the hanging woods at Burgate. *Bryonia dioica*, amongst hedges and thickets in several situations. *Dipsacus pilosus*, sparingly in a lane near Busbridge Park leading from Holloway-hill, and in a withy-bed towards Milden's Wood. *Lactuca muralis*, upon the dry walls of Busbridge Park, in the direction of Hambledon. *Gnaphalium sylvaticum* (*β. rectum*) has been found very sparingly upon the slopes towards Hurtmore; the same with *Iris foetidissima*. *Verbascum Thapsus* and *nigrum* are generally distributed in the different lanes. *Antirrhinum Orontium* is a common plant in the corn-fields at Hide-stile Farm, Enton &c. *Orobanche minor* is abundant in most of the clover-fields; *O. major*, sparingly in a furze-field on Munstead Farm. *Verbena officinalis* at the foot of a wall against the bridge and other similar situations. *Salvia verbenaca* is plentifully distributed over the slopes near Milden's Wood and St. Catherine's Hill. *Pulmonaria officinalis*, *β. angustifolia*, occurs by the road-side at Milford, in all probability an outcast from the nursery-ground. *Chenopodium olidum*, plentiful at the foot of a wall in Farncomb-street, against the chapel. *Polygonum dumetorum* appears to be by no means rare in coppices and hedge-rows; it was first noticed in this vicinity by my friend Mr. Henry Bull, in an alder-car on Manor Farm. *P. Bistorta* is abundant in a coppice at Tewsley, by the path-side. *Orchis Morio*, heath in Hoe Farm towards Burgate-woods. *Epipactis latifolia*, corn-field next Busbridge Coppice, opposite the pond at Thorncomb-street. *Carex Pseudocyperus* in an alder-car on Manor Farm,

and Barn Moors, Compton. *Melica uniflora* is abundant upon most of the shady hedge-banks &c. *Viscum album* is abundant upon most of the fine old whitethorns in Peperharrow Park, and in two instances it has established itself upon the *Acacia*. Several lime-trees in Loseley Park present a remarkable appearance from the exuberance of this parasite.

The third division comprehends large tracts of barren heath, principally occupying the western and south-western portions of the district rising in many places into arid elevations, while the plains and hollows afford boggy ground and extensive ponds.

Many delightful rambles may be made in these directions. Witley Lagg is rich in bog-plants :—here may be found *Viola palustris*, *Drosera rotundifolia* and *intermedia*, *Epilobium angustifolium*, towering with its beautiful and conspicuous racemes of rose-coloured flowers ; the delicate and interesting *Campanula hederacea* is found intermixed with *Vaccinium Oxycoccus*, *Scutellaria minor*, *Narthecium ossifragum* and a plentiful supply of *Carices*. The numerous morasses on Witley Common will offer similar plants, with the addition of *Hypericum elodes*, *Radiola millegrana*, *Peplis Portula*, *Anagallis tenella* and *Salix fusca*. On the drier and elevated portions *Teesdalia nudicaulis* and *Arenaria rubra* are plentiful. *Cuscuta Epithymum* is frequently to be seen in tangled masses, profusely overrunning the *Ericæ*, *Ulex nanus*, &c. *Matricaria Chamomilla* is also plentiful, and its perfume is quite overpowering on a warm sunny evening ; this plant also occurs upon Highdown Heath, in the vicinity of Pleck Pond, on the margins of which grow *Veronica scutellata* and *Littorella lacustris*,—the latter in abundance. The moors skirting Witley Common on the north, will afford, amongst other good things, *Carduus pratensis* and *Eriophorum vaginatum*. Upon the margin of Forked Pond, *Typha angustifolia* is plentiful. *Arnoseris pusilla* abounds in a gravelly field behind the public house at the Hammer Ponds. The extensive heaths in the direction of Thursley cannot fail to attract attention, and will amply repay the trouble of investigation. In the turf-pits will be found *Utricularia minor*, *Rhynchospora alba*, the *Eriophori*, and a host of bog plants. Elstead and Puttenham Commons are equally prolific. On the latter, at Cut-mill Pond, immediately bordering upon the parish of Godalming, the interesting addition of *Elatine Hydropiper* to the southern Flora, has been made by Mr. Walter Reeves, for I have no doubt "*Cuck* mills" is a misprint in the 'Annals and Magazine of Natural History' for CUT Mill, as this is within five miles of Farnham, and I can hear of no such place as Cuck Mills. This very

rare plant grows plentifully here, accompanied by *E. hexandra* and is invariably submerged, whilst the latter not only grows luxuriantly under the surface, but extends itself upon the sandy margins that are occasionally covered with water. On the margin of the same pond occurs *Limosella aquatica*, and in a deep morass under the park-paling of Hampton Lodge will be found *Potentilla Comarum*.

Omitting the mention of *Phænogamous* plants of a less interesting character, I proceed in conclusion to notice the *Cryptogamic* productions of the district. And from the foregoing description of the geological features and general aspect of the country, it may be expected that this branch of the subject will prove equally interesting and extensive. With the exception however of the *Filices* and *Pteroides* I have hitherto been unable to devote the necessary attention to this division of the Flora for its satisfactory elucidation. I hope at some future period to be able to supply this desideratum.

The deep rich cuttings and damp woods and shady lanes are particularly favourable for the growth of several species of the *Filices*. Many of the commoner species grow in the greatest luxuriance, as in the case of *Polypodium vulgare*, which completely covers the tops and sides of the hedge-banks, preferring to locate on the decayed stumps of trees, and is equally abundant upon the walls at Westbrook &c.

Polystichum lobatum and *aculeatum* appear to be equally distributed; the dingle towards Hurtmore is a favourable station, as is the case with Lovers' Lane, Farley Hill.

Lastræa Thelypteris occurs very sparingly at Hurtmore Bottom; hitherto I have only found it with barren fronds. *L. Oreopteris* sparingly upon the extreme end of Witley Common, by the edge of a wood towards the Hammer Ponds: this beautiful fern grows in the greatest luxuriance in the Devil's Punchbowl at Hindhead. *L. Filix-mas* is very common in the shady lanes and coppices. *L. dilatata* (*multiflora*? of Newman) grows luxuriantly in most of the wet woods. At Cosford, Westbrook, &c. it abounds at the foot of the alder-stumps and in other similar situations, whilst *Athyrium Filix-fœmina* generally prefers a more open situation, by the sides of ditches and water-courses that are inclosed with underwood. *Asplenium Trichomanes* is very common upon the north sides of most of the old walls and bridges in the neighbourhood. On a damp hedge-bank at the back of Farley Hill, the fronds attain a great length. *A. Adiantum-nigrum* abundantly in the same locality, and equally so in several others; it rarely occurs upon any of the walls in this district. *A. Ruta-muraria* is plentiful upon the garden-wall of Unstead House, and is found more

sparingly in other situations. *Scolopendrium vulgare* will be found in the greatest exuberance in the dingle towards Hurtmore, where the variety with multifid fronds frequently occurs. *Blechnum boreale* is a common plant upon the barren heaths, preferring the sides of the moist ditches. Highdown Heath and Witley Common will afford this plant in the greatest perfection. *Pteris aquilina* is generally distributed over all the uncultivated ground. *Osmunda regalis* grows plentifully by the side of Forked Pond next Thursley Common, and sparingly upon Hambledon and Highdown Heaths: but to see it in perfection, the admirer of this elegant species must visit the Devil's Punchbowl, where the fronds attain a great height, and will convey the idea of a truly royal fern. Cattle do not reject the fronds of this species; those at Forked Ponds are annually eaten off by the stock. *Botrychium Lunaria* is evidently a rare species in this neighbourhood. During the summer of 1840, I found three plants opposite Pleck Pond on Highdown Heath, since which I have not seen a single specimen growing. *Ophioglossum vulgatum* appears to be equally as scarce; a small patch occurs in the Compton chalk-quarries: a closer investigation on the north side of the Hog's Back will probably yield this plant abundantly. *Ceterach officinarum* has been found very sparingly in two situations; my friend Mr. H. Bull first noticed it on Westbrook garden-wall, and a few days subsequently I discovered it on a wall at Catteshall Farm: with the exception of the station at Haslemere, noticed in Phytol. i. 1110, no other locality in this county has been recorded for this plant.

Lycopodium clavatum is in great plenty on High-down heath, *L. Selago* very sparingly in the same locality, *L. inundatum* occurs abundantly in all the wet parts of the different commons. *Equisetum Telmateia* is generally distributed in the wet parts of the hills; it is abundant upon the hedge-banks against Busbridge Park, in the direction of Tuesley: whilst *E. arvense* appears to be more generally located higher up in the corn-fields which are inclined to be rather springy. *E. palustre*, in marshy meadows. At the back of Shalford, this species occurs abundantly in a wet meadow. *E. fluviatile* is in most of the ditches, and will be found in the greatest perfection at Hurtmore Bottom, where the turf for fuel has been dug, also at New Pond, and one of the Hammer Ponds. *E. sylvaticum*: this species I noticed for the first time last summer in a wood near Burgate, on the weald clay.

J. D. SALMON.

Godalming, February 3, 1846.

Remarks on the Potato-Murrain. By W. WILSON, Esq.

THE Warrington Natural History Society having engaged my services in the investigation of this subject, I am induced to send you a brief statement of the contents of my paper recently delivered to that body, so far as the same may be applicable to the present occasion, when my principal design is to discuss the opinions and statements made public by Mr. Stephens, and by the Rev. M. J. Berkeley, whose very elaborate essay appears in the 'New Journal of the London Horticultural Society.'

Mr. Berkeley considers the peculiar characteristic of the potato-murrain is found in the brown spots of the tuber; and the fœtid, putrescent state, according to his view, is only the advanced stage of the same disease. My own conclusion is, that these two states have no actual connexion, and may be considered as two distinct diseases. The brown spots are owing to an incrustation of earthy matter, most probably silica, since it resists the action of acids, even when the tissue is incinerated. The "dry-rot" of Germany in 1830, I consider to have been an aggravated form of the same disease, and as much the opposite of the fœtid rot as *petrification* is the opposite of *putrefaction*. I do not consider it fully proved, as yet, that either of the diseases is necessarily connected with the presence of fungi in the tuber, though I admit the fact, that *Botrytis infestans* was present in those numerous cases which led Mr. Berkeley to state "that in an earlier stage of the disease the *Botrytis* is uniformly produced," and that one potato, when divided, produced the fungus from every brown speck of the cut surface. The only fungus that I could find in the cellular tissue was *Fusarium Solani*, and this occurred in one instance only, and not much below the cuticle of the tuber. In all other cases the brown specks had nothing but earthy incrustation. The cells so affected were not emptied of their starch granules, as Mr. Stephens says, nor could I perceive any difference in this respect, except that a number of cells immediately surrounding the brown cells seemed to be empty, no starch having been deposited therein during the growth of the tuber.

Mr. Berkeley is disposed to support Dr. Morren's opinion that the disease is attributable to the action of *Botrytis* upon the foliage of the growing potato-plant. It is certainly a very remarkable circumstance that the fungus should have infested the leaves so extensively, growing out from the interior through the stomata and insinuating the mycelia throughout the parenchymatous substance, where the

principal vegetative functions of the potato-plant are carried on. No one who has witnessed this can hesitate to admit that very great derangement of the functions must arise from such interference on the part of the fungus, and the consequence may have been a diseased action upon the tubers then in the course of formation. Mr. Berkeley accounts for the presence of the fungus upon the plants while as yet in a healthy state. I quite agree with him in the opinion that "as far as the aerial portions of the plant are concerned, the Botrytis is the immediate cause of destruction in all those cases where the potato herbage was not cut down by unseasonable frost" — that the disease commences in the leaves, and that the potato-herbage was very generally infested with the Botrytis. I admit also, that "it is not the habit of the allied species of fungi to prey on decayed or decaying matter, but to produce decay," but I do not admit the conclusion that "the plant *becomes unhealthy* in consequence of the presence of the mould which feeds upon its juices and prevents the elaboration of nutritive sap in the leaves." That an injurious effect does ensue under the action of the fungus, I admit, but then I consider that a *previously unhealthy condition* of the potato-plant (whether from atmospheric causes or otherwise) may be a necessary condition for the establishment of the parasitic fungus upon the potato-plants.

Until the disease is better defined and ascertained, and its history better known in reference to former years, I am induced to consider that the atmospheric influences of the past season were quite sufficient to produce a diseased state of the potato-plants before the Botrytis attacked them. With Dr. Montagne, I however admit the intimate connexion of the disease with parasitic fungi.

Dr. Andrew Ure, in the 'Lancet' for January, has given a very singular view of the disease: he says, "This vegetable distemper, like that of the cholera, while general in its diffusion, is determined to particular localities and plants by certain predisposing causes; yet is independent of these, having occurred in many regions *where such causes did not materially operate*. Whether it will recur no human being can predict." Certainly a disease of such a capricious character as this is represented to be, must baffle every attempt at prognostication. We are principally concerned at present to ascertain what are the *predisposing causes*. In this neighbourhood the potato-herbage was certainly killed off by frost, which also destroyed the Dahlias and scorched the Fuchsias of the gardens round Warrington; but I am not by any means disposed to deny that the Botrytis was, until then, exerting an injurious action upon the crops. I believe that the

very same causes materially operated here as elsewhere in producing the brown-spotted and also the fœtid disease, and I hope that the readers of the 'Phytologist' will keep a good look-out in the coming season for the fungus which is suspected to have been influential in some way to the detriment of the crops of the past season.

Dr. Ure, in the same article, has levelled an ill-directed criticism at Professor Liebig, overlooking the fact, that Liebig states that not only the diseased, but apparently sound potatoes, were found last year to contain an unwonted principle, casein, and that in his work on 'Chemistry applied to Agriculture,' casein, whenever present in vegetables, is said to be always in a state of *extreme solubility*, and therefore does not require an alkaline menstruum, such as Dr. Ure employed. The filtered juice of the potato contains the casein, and on the addition of any acid it is precipitated.

As to the protective effects of sea-air, I would suggest to Mr. Stephens that the mild temperature of the coast may have operated only in preventing the injury from frost. I do not find that the potato-disease was confined to inland situations.

My remarks must close here for the present. I shall probably resume the subject in a future number of the 'Phytologist.'

I will just add, since Mr. Stephens has omitted to supply the correction, that Dr. Montagne's fungus, observed by him only in potatoes that had germinated, is named *Artotrogus hydnosporus* (from *apros* and *τρογω*). For the knowledge of this interesting fungus I am indebted to the kindness of the Rev. M. J. Berkeley, whose assistance during my inquiries has been of the greatest service to me.

W. WILSON.

Orford Mount, February 3, 1846.

Note on Mimulus luteus. By GEORGE LAWSON, Esq.

IN writing the note on the occurrence of *Mimulus luteus* in Forfarshire, which appeared in the January number of the 'Phytologist' (Phytol. ii. 389), I merely wished to call the attention of botanists to the plant, for it seemed to me, that although its claim to rank as British did not appear to be strong, it at least merited notice from the fact that it is really naturalized in this country. Since the appearance of that note several articles on the subject have been published in the 'Phytologist.' These, however, do not, I think, go to prove that it is really a native.

Mr. Townsend remarks (Phytol. ii. 421) that "Loudon gives the date of its introduction 1826, 'Bot. Reg.,' 1830." I fear, however, there must be some mistake here, for in Loudon's 'Encyclopædia of Plants' the date of its introduction is stated "1812." I have, however, at present in my hands no other authority to refer to. The date of introduction of the plant seems to be of some importance, as on it depends, in a degree, the probability of its being considered indigenous. The Rev. W. T. Bree states (Phytol. ii. 421) that he found the plant naturalized and thriving robustly near Abergavenny "so long ago as the summer of 1824," and Mr. Jackson mentions the circumstance of his father's having found it at the Invergowrie station "more than twenty-two years ago," adding "I believe it was known to some botanists a good many years previous to that date;" and this former statement of Mr. J. is corroborated by a very intelligent person who has long resided near Invergowrie, with whom I was lately conversing on the subject. Now all these dates are prior to 1826, and if the plant was not introduced into the gardens until that year, as stated by Mr. Townsend, it is clear that it could not be a garden fugitive. But I am rather inclined to think that the date of introduction given in the Encyclopædia (1812) is correct, the more so, from being credibly informed that the plant was known in the gardens in this quarter so early as the year 1814. If it has been really found naturalized *previous to the date of its introduction*, the circumstance would form a strong proof in favour of its being indigenous; but assuming 1812 to be the correct date of introduction, I am not aware of any report to this effect having yet appeared. If it can be ascertained that the plant has somewhere been found previous to 1812, then the probability will be strong that it is a native. In the meantime, however, I think we can only consider it naturalized.

GEO. LAWSON.

108, Hawkhill, Dundee,
10th February, 1846.

Notice of 'Flora Azorica; founded upon the Collections and Notes of the two Hochstetters. By MAURITIUS SEUBERT, M.D., &c. Bonn, 1844.'

A peculiar interest has been given to the Botany of the Atlantic by the ingenious hypothesis on 'Endemic Plants' laid before the last meeting of the British Association by Professor Edward Forbes, i

which he endeavours to account for the present distribution of species in Britain, by supposing them to have been originally created at widely distant epochs of time, and to have migrated into Britain from different and distant centres of creation. The views of Mr. Forbes may be conveniently divided into *facts* and *conjectures*. Firstly, ascertained facts respecting the actual present distribution of plants in Britain; secondly, conjectures about the original causes of certain remarkable peculiarities in their distribution. There is originality, doubtless, in the conjectures, but so far as the botanical facts are given with accuracy, they do not possess that novelty which has been claimed for them on behalf of Mr. Forbes. The basis of this, the only substantiated part of this paper, was in print ten years ago.

Our immediate purpose, however, is not to enter upon any critical examination of the views propounded by Mr. Forbes, but rather to suggest to those who may feel interested in testing their soundness, that the work whose title is translated above, is well calculated to be of use in their examinations. The first islands south-west from Britain, and almost a central group in the Atlantic, should afford a Flora well adapted for trying the soundness of Mr. Forbes's bold conjectures, as to the geographical centres from which Britain has derived its own Flora. And we may perhaps say with equal propriety, that they should also afford a test of the supposed different epochs of creation, since their geographical position should connect them more proximately with the (supposed) oldest Floras, while their apparently recent formation, even now only in progress, ought to connect them rather with the (supposed) newest Floras. In this view, the 'Flora Azorica' seems particularly worthy the attention of British botanists.

It is a remarkable circumstance that we should have reached nearly to the middle of the nineteenth century, in almost complete ignorance, botanically speaking, of a group of islands which lie so near to Europe, with which a considerable trade is carried on from England, and which are so frequently touched at by our homeward-bound vessels. Some few of the more conspicuous plants were introduced into Kew Gardens by Masson, and others were placed in the herbaria of Banks and Smith from the same source, though with unpublished manuscript names only. In the year 1838 the islands were partially explored by the younger Hochstetter, with his fellow-traveller Guthnick, who visited six of the nine islands. Six years afterwards, Dr. Seubert published the first and only 'Flora Azorica,' being a descriptive list of the species collected by Hochstetter, with some few additions from other sources. Seubert enumerates nearly four hundred

species, cellular and vascular ; a very large proportion of these (more than half?) being species identical with those of Britain ; and including amongst them examples of all the (supposed) five distantly created and distantly derived Floras, now differently distributed in Britain ; as well as others which cannot be considered belonging to any one of the five.

About a hundred and fifty additional species of vascular plants have been brought to this country from the Azore islands, since the collections of Hochstetter and Guthnick were formed. A considerable number of these still remain unrecorded from those islands, except by their labels in herbaria ; but upwards of a hundred of them were enumerated in Mr. Hewett Watson's list of his collection, made in the same islands, in 1842. The '*Flora Azorica*,' however, remains the standard work on Azoric Botany, including the original descriptions of the new and endemic species, with accurate figures of a score of them. According to the census of Dr. Seubert, among the 400 species there are fifty which are peculiar to those small islands, only twenty-three which are common to those isles with Madeira and Canary (one or both) but not known in Europe. Increased knowledge of the Botany of the Azores, with the more complete series of Madeiran plants preserved in English herbaria, now lead to some changes in these estimates. The number of species absolutely limited to the Azores is rather less than stated by Seubert, while the number of species common to them and Madeira requires to be taken at a higher figure. Speaking in round numbers, we may say that four-fifths of all the species now wild in the Azores, are wild also in Europe, from which many of them have been doubtless carried to the Azores by the early settlers. Of the remaining one-fifth, nearly the whole number are peculiar to the Azores, or to the archipelago of Atlantic Islands, which includes also Madeira and the Canaries. Some have emigrated to the Azores from the continents of Africa and America.

Among the few exceptions, one is striking. The elegant *Lycopodium cernuum*, quite a tropical form of its genus, unknown in Madeira and (as we remember) in the Canaries, reappears in the more northern latitude of the Azores, where it grows only by the warm springs in St. Michael's. Here is a fine fact for vestigians and geologists, who explain the tropical character of our fossil Flora, in boreal latitudes, by a supposed internal heat in the ground during long ante-human eras. In these same isles the arctic *Lycopodium*

Selago flourishes in the cool climate of the higher mountains, in company with *Calluna vulgaris* and *Blechnum boreale*.

C.*

Notice of the 'London Journal of Botany,' Nos. 44, dated August, 1845, to No. 50, dated February 1846, inclusive.

No. 44.—The first article is entitled "Notes of a Botanical visit to Madras, Coimbatore and the Neelgherry Mountains," by George Gardner. This embraces Mr. Gardner's personal adventures and remarks, during an excursion from Ceylon to the residence of Dr. Wight; interspersed, too, with some valuable observations on the structure and technical characters of the plants seen on the journey. The following passage may have some interest and instruction for our younger readers.

About Coimbatore grows the *Ficus Benjamina*, "very remarkable for the profusion of roots which it throws down from its branches. These, when they reach the ground, become secondary stems, as in the true Banyan tree. Those who wish additional facts to prove that the wood of exogenous trees is formed by bud-roots, have only to look at one of these trees to be fully convinced of the truth of this beautiful doctrine. The main stem of some of them, indeed, I may say all, does not form one solid mass, as usually occurs in other trees, but is a congeries of thick, branching roots, which come down from the lower ends of the large branches, surround the original shoot or stem, and overlay each other in such an open reticulated manner, that daylight can often be seen through a trunk several feet in diameter."

The next is an elaborate article upon the Piperaceæ of Hooker's herbarium, by a learned botanist of Holland, and is entitled, "*Ani-madversiones in Piperaceas Herbarii Hookeriani; auctore Dr. F. A.*"

* The Editor begs to observe that the notices thus signed are not written by himself, but are kindly contributed by a correspondent. While thus disclaiming the merit of such notices, the Editor also wishes to save his subscribers the labour of detecting discrepancies between the opinions expressed in different anonymous articles. "Many men of many minds" is part of an old nursery-rhyme, and as the anonymous papers are printed verbatim and without prior consultation or collusion on the part of the respective writers, it is almost unavoidable that "many" opinions should also from time to time be broached. The mention of Mr. Forbes's paper in the present article has led us to append this foot-note; since a notice of that paper may hereafter be contributed by another botanist.

Guil. Miquel." This fills all the rest of No. 44, and is continued into the succeeding one.

No. 45.—Following the *Animadversiones*, we have "Descriptions of two new genera of Euphorbiaceæ;" as also, remarks "On the affinities of the genera *Henslowia*, *Raleighia* and *Alzatea*," by Dr. Planchon. "Botanical Information" succeeds, chiefly concerned with the journeys and collectings of Geyer and Gordon, in western America. "Contributions to the Botany of South America," by Mr. Miers, concludes the number, and occupies several pages of the next. A good article, but too technical for extract.

No. 46.—"Note on the Flower of the *Narcissus*," by Louis Cagnat, describes the morphological structure, if we may so term it, of the *Narcissus*. Then comes a "Description of a new genus of *Diosmeæ*," by Dr. Planchon, who dedicates the two species to the author of *Pantagruel*, in conferring upon them the name of *Rabelaisia*. "*Algæ Novæ Zealandiæ*," by Hooker and Harvey, occupying a considerable portion of this number, which concludes with the continuation of Mr. Gardner's "Visit to Madras," &c. Here Mr. G. describes his excursions about the Neelgherry hills, in company with Dr. Wight. Their first excursion took them to the highest summit, that of Dodabetta, 8400 feet above the level of the sea, and having a mean temperature of 56° or 57°. "On shady banks, and even in open, exposed places, the wild strawberry (*Fragaria elatior*) grows in the greatest profusion, from the level of Ootacamund [about 7000 feet], even to the very summit of the mountain, in which latter situation I found it, both in flower and fruit." At this elevation, while the species are mostly different, the generic character of the Flora partakes much of the European. Omitting the specific names, as unnecessary to the British botanist, we find the following genera enumerated: *Anemone*, *Ranunculus*, *Dipsacus*, *Wahlenbergia*, *Bupleurum*, *Pimpinella*, *Valeriana*, *Senecio*, *Gnaphalium*, *Gaultheria*, *Anaphalis*, *Cotoneaster*, *Hedyotis*, *Euonymus*, *Microtropis*, *Monocera*, *Eugenia*, *Celtis*, with *Prunella vulgaris* and *Alchemilla Zeylandica*; the latter so like our British *A. vulgaris*, that it was considered to be really such by Dr. Arnott.

No. 47.—Mr. Gardner's "Visit" is here concluded on his return to Ceylon. "It is curious" he writes, "that while the Neelgherries, and the mountain ranges of Ceylon have many European forms of plants in common, yet each presents a few which are peculiar to itself. Thus the *Prunella vulgaris*, *Parnassia Wightiana*, *Lysimachia Leschenaultii*, *Rosa Leschenaultii*, the four species of *Viburnum* and two of

Lonicera, of the Neelgherries, have not yet been discovered in Ceylon; while, on the other hand, the *Agrimonia Eupatorium*, *Ranunculus hastatus* and *Viola Walkeri*, of Ceylon, are unknown in the Neelgherries. They each possess a *Dipsacus*, but these are distinct, though nearly allied, species."

Bongueria, a new genus of *Plantagineæ*, is next described by Mons. J. Decaisne, having been figured in the preceding number. More interesting for the British botanist is the next article, "Observations on the Botany of Great Arran Island, Galway Bay," by Mr. Andrews, whose observations on Irish plants are always valuable. It is clear that the Irish Flora is not yet by any means sufficiently ascertained. Several examples are mentioned by Mr. Andrews, of species quite recently detected in Ireland, though known in England or Scotland. A single specimen of *Carlina racemosa* was found among abundance of *C. vulgaris* in Arran island, which the editor of the Journal suggests to have been an introduced plant. An advertisement of Shimper's Mosses, a letter from Mr. Bridges, containing remarks on South American Botany, a continuation of Mr. Bentham's valuable but too voluminous "Notes on Mimoseæ," complete the contents of this number.

No. 48.—"Notes on Mimoseæ" continued, "Enumeration of plants collected by Sir Robert Schomburgh, in British Guiana, by George Bentham." "Description of three species of plants from Upper India." "*Fichtia*, a new genus of arborescent *Compositæ*," by Dr. J. D. Hooker. "Zeyher and Burke; South African collection of Plants." Geyer's "Notes on the vegetation of the Missouri and Oregon territories," continued. These are the contents of No. 48, which offers nothing particularly requiring extract or comment.

No. 49.—"Decades of Fungi," by the Rev. M. J. Berkeley. "Botanical Information." "Descriptions of new Mosses, from South America," by Dr. Taylor. These three articles occupy the present number. The "Botanical Information" includes notices of various collections for sale, an announcement of Mr. Ralf's new work on British *Desmidiæ*, Mr. Burke's Journal of his travels to collect in South America, a continuation of Geyer's "Notes on the vegetation of the Missouri and Oregon."

No. 50. (February, 1846). Continuation of Dr. Taylor's "Descriptions of South American Mosses" commences this number. A paper follows, on a natural group of *Carices*, by Dr. Boott, including the British *C. vesicaria* and *C. ampullacea*, together with their American allies, *C. utriculota*, &c. The chief part of the number is devoted to

a (concluding?) continuation of the elaborate "Notes on Mimosæ," by Mr. Bentham. The last article commences another paper on the South African journey of C. L. Zeyher, the fellow-traveller of Burke.

C

On the occurrence of Ranunculus Lenormandi in Westmoreland.

By C. CARDALE BABINGTON, Esq., M.A., F.L.S., &c.

IN the last number of the 'Phytologist' (Phytol. ii. 423) Mr. James Backhouse mentioned his having found, near Coniston Water, a *Ranunculus*, which he named *R. hederaceus*, β . *grandiflorus*, of my Manual.

I have recently obtained, through his kindness, a specimen of the plant, and have the satisfaction of stating that it is the *R. Lenormandi* of F. W. Schultz, which is well figured in the 'Atlas de la Flore des Environs de Paris' (tab. 1, f. 3, 4), of Cosson and Germain. The first notice of it as a native of Britain is in the 'Annals of Natural History,' xvi. 141.

I have now seen it from Westmoreland, Staffordshire, Leicestershire, and Devonshire, and I believe that Mr. Borrer has found it in Sussex. It differs from *R. hederaceus* in the form of its carpels: in this they are obovate, and tipped with a terminal style; in *R. hederaceus* they are obtuse, and have a lateral ascending style. It has also much broader and scarcely at all adnate stipules, whilst those in its ally are adnate nearly throughout. This plant will probably prove to be common in Britain now that attention has been drawn to it.

C. C. BABINGTON.

St. John's College, Cambridge,

February 12, 1846.

Early Flowering of Plants, in 1846. By PETER INCHBALD, Esq.

AMONG the phænogamous plants I have noticed in my walks during the month of January, there are some few which I think you may consider worth recording in the pages of the 'Phytologist,' as a proof of the mildness of the season. I have given some attention to Botany during several years, but I never remember vegetation to have made such rapid advances in January of any former year. I have gathered between thirty and forty flowers in the past month, exotic and native,

in our immediate neighbourhood. Among them are *Sherardia arvensis*, *Helleborus viridis*, *Anemone nemorosa*, *Draba verna*, *Potentilla fragarioides*, *Ficaria verna*, *Ruscus aculeatus*, *Chærophylum sylvestre*, *Daphne Laureola*, and *Erigeron acre*. P. INCHBALD.

Adwick Hall, Doncaster, Feb. 2, 1846.

BOTANICAL SOCIETY OF LONDON.

February 6, 1846.—Edward Doubleday, Esq., V.P., F.L.S., in the chair. Donations to the Library were announced from the Dublin Natural History Society, the Liverpool Literary and Philosophical Society and Dr. Martius. British plants had been received from Professor Balfour, Mr. R. Embleton, and Mr. J. T. Mackay; and foreign plants from Mr. T. C. Hunt and Dr. Dickinson.

The following plants were exhibited:—

Vaccinium macrocarpum, (Ait.). Discovered by Dr. Bidwell, in Soughton Bog, near Mold, Flintshire, in August, 1845, (see *Phytol.* ii. 441).

Cerastium strictum, (Linn.). Discovered by Mr. Andrews on Great Arran Isle, Galway, Ireland, in August, 1845, (see *Phytol.* ii. 441).

Poa Balfourii, (Parn.). Collected on Ben Voirlich, near the head of Loch Lomond, Scotland, by Professor Balfour.

Cerastium holosteoides, (Fries). Collected by John Storey, Esq., on the banks of the Tyne, N.B. This example has the glabrous surface of *C. holosteoides*; but scarcely differs from *C. triviale* in the character of its inflorescence: it is thus a connecting link between them.

Trifolium Bocconi and *Molineerii*, and "*Orobanche amethystea*?" Collected by the Rev. W. S. Hore, as recorded in the '*Phytologist*' for August, 1845, (see *Phytol.* ii. 235).

Primula veris and varieties. A series of fourteen specimens, to show the transition from *P. veris* to *P. vulgaris*; being some of the plants raised from the seeds of *P. vulgaris*, var. *intermedia*, as recorded by Mr. Hewett Watson, in the '*Phytologist*' for July last (see *Phytol.* ii. 217).

Read, "An Outline of the Flora of the Neighbourhood of Godalming, in the County of Surrey, with brief Notices of the Geological Features and general Aspect of the District," by J. D. Salmon, Esq., Corresponding Member of the Society, (*Phytol.* ii. 447).—G. E. D.

BOTANICAL SOCIETY OF EDINBURGH.

February 12, 1846.—Dr. Balfour, President, in the chair.

Mrs. John Stewart, of Nateby Hall, Lancashire, was elected a life member of the Society.

A large collection of plants from Chippawa, Niagara, and various parts of Canada, presented from Dr. Philip W. MacLagan; and specimens of some of the rarer alpine plants of Scotland, presented by Dr. Balfour, were announced.

The following communications were read:—

1. On the Potato Disease. By Mr. John Goodsir, Demonstrator of Anatomy in the University of Edinburgh.

In reference to the nature of the potato-disease, Mr. Goodsir stated that there could be no doubt as to its general resemblance to an epidemic. Although we may not have discovered the causes of epidemic diseases, we know they depend partly on local or individual circumstances which may be obviated, and which influence some epidemics more than others; and partly to general influences, commonly supposed to be atmospheric, but regarding which we actually know nothing but their existence. Mr. Goodsir then alluded to the striking general resemblance between the rise and progress of epidemics, and the appearance, non-appearance, and increase of fungi from season to season. Coupling this analogy with the opinion generally gaining ground, that certain epidemics owe their existence to the growth of fungi or analogous beings in the animals afflicted, Mr. Goodsir conceived that we are bound, in our attempts to explain the nature of the potato-disease, not to overlook the fungi which exist in the diseased tubers. After stating Mr. Berkeley's late researches into the fungoid nature of the disease, Mr. Goodsir observed, that he was still inclined to believe in the organic nature of the brown matter, and he founded his belief chiefly on its peculiar form, and on its position in the cells. This view of the nature of the potato-disease did not afford an indication of cure or prevention, for the diseases with the nature of which we are best acquainted are not always those we can most certainly cure. It holds out, however, a hope that the murrain may not recur. The occurrence of fungi as the cause of disease was pointed out in various instances, especially diseases of the skin, where mycodermatous fungi are seen, diseases of the mucous membrane, and diseases of the stomach. The occurrence of cellular plants (*Torula cerevisiæ*) during fermentation, was also alluded to as corroborative of Mr. Goodsir's views. (The paper was illustrated by large drawings of the diseased

structure of the potato, of the brown granules, and of *Botrytis infestans*, &c.).

Dr. Greville, in making a few observations, commenced by paying a high compliment to the talents of Mr. Goodsir, and the general accuracy of his microscopical researches. "With reference to that gentleman's theory," said Dr. Greville, "I see nothing improbable in the potato-murrain being analogous to epidemic diseases in the animal kingdom. In fact, the analogies between the two great kingdoms of organized matter are so many and so strong, that he might reasonably look for much similarity among some of the phenomena exhibited in both, with regard to disease. Like epidemics in the animal world, the one under consideration has appeared almost simultaneously in various and remote parts of the globe; a fact which seems to indicate some atmospheric influence. The real cause, as in the case of all epidemics, is involved in the greatest mystery. Possibly a union of conditions may have taken place, favourable to the development of the fungus which appears to be invariably present. We all know that in the germination of monocotyledonous and dicotyledonous seeds, a union of three conditions is essential: the presence of air, warmth and moisture. If any one of these conditions be wanting, the seed will not germinate, but, if otherwise favourably circumstanced, will remain in a dormant state for an indefinite period. In like manner I think it not improbable that certain conditions — one or more of them being of a meteorological character — may have combined in the course of the past season to promote the growth of the potato-fungus. The question has been asked, How do the spores of the fungus obtain access to the vegetable tissue? This at present is a matter of mere speculation. They are excessively minute; and it has occurred to me, that they, as well as the spores of other of the minute fungi, may at all times inhabit the tissue of those species of plants to which they are respectively peculiar, without, under ordinary circumstances, deranging the vegetable functions, in the same manner as minute parasites infest different parts of the animal structure. In addition to this, there must be in plants as well as in animals, a *predisposition* to receive the disease; for even epidemics make a selection of their victims. The fungus did not attack all the plants of the potato indiscriminately; some varieties throughout the infected districts having, comparatively speaking, escaped: a most valuable fact for the consideration of the practical agriculturist. With reference to the brown granules, which Mr. Goodsir believes to be organic, I confess I have been quite unable to satisfy myself regarding

their nature. Their form is not constant, and under the microscope I sometimes find it impossible to distinguish them from the grains of starch. I cannot, besides, detect any determinate arrangement of the granules, which the microscopical observer would naturally expect to exist in a series of more or less spherical organic bodies. Certainly the brown spots in the tuber require more investigation than they (so far as I know) have received. My attention was directed to the potato-disease late in the season, and no opportunity was afforded me of examining the leaves or the stalks. It has struck me, however, in reading Mr. Berkeley's valuable memoir, that the black spots on the stalk, where the cellular tissue is described as filled with a dark, grumose mass, may correspond with the brown spots in the tuber, the cells of which contain the brown, grumose granules, and that the one may throw some light on the other.

Mr. Walter Crum, of Glasgow, detailed his experiments on the brown colouring matter of diseased potatoes, and stated that it contained nitrogen. He had carefully examined the brown granules alluded to by Mr. Goodsir, but did believe it was a fungus.

Dr. George Wilson was much interested in what Mr. Goodsir had said in reference to the connexion between the disease in the potato and the appearance of a fungus, and in the comparison which he had drawn between it and a solution of sugar undergoing the vinous fermentation, in which a cryptogamic plant always showed itself. Dr. Wilson was of opinion, however, that the vegetable physiologist was not entitled to refer to the fungus as the *cause* of fermentation, or to speak of it as more than an accompaniment. On the other hand, he was free to acknowledge, that as the chemist could not point to a single example of the vinous fermentation having been observed without the *saccharmyces* being seen also, he was not at liberty to explain the fermentation without reference to the fungus, as he generally did. Dr. Wilson believed that fermentation was at present an Oregon territory in science, which the chemist and physiologist must, in the meanwhile, agree to hold in joint occupancy till it could be settled which had the best right to it, or on what terms it should be divided. Mr. Goodsir had not done himself the justice to mention, that in a remarkable case of disease in the human subject, in which the contents of the stomach underwent a change exceedingly like that which vegetable juices suffer when the lactic or viscous fermentation is going on in them, he predicted the great likelihood of a cryptogamic plant being found, and discovered a very curious one — the *Sarcinula ventriculi*. Dr. W. would suggest to microscopic observers, that it was

possible each of the true fermentations might have an Alga peculiar to itself, and that it was well worth their attention to investigate the subject. Sugar could be fermented into alcohol and carbonic acid—into lactic acid—or into mannite and mucilage. It was desirable to know if a new Alga appeared when the fermentation changed its character. Dr. W. anticipated that no cryptogamic plant would be found when diluted alcohol was converted into acetic acid by platina black, because no azotized compound was present to yield nitrogen to the fungus, without which, in all probability, it could not be developed. The acetous fermentation, however, differed in several important particulars from the others referred to.

Dr. Douglas Maclagan entertained no doubt from the observations of Mr. Goodsir, Mr. Berkeley, and others, that the fungus present in the diseased potato had originated in the leaves, and been propagated down along the stem to the tubers. He had himself observed, and rudely sketched, an organism in the diseased tubers, which, from the drawings exhibited this evening, he had no doubt was identical with that observed by Mr. Berkeley growing from the stomata of the leaves. There was also, he thought, little doubt as to the nature of the brown matter which pervaded the diseased portions. Although it had not been demonstrated microscopically to be a fungus, the fact of its having been separated by M. Payen, by maceration, and subsequent boiling with diluted sulphuric acid, and its being ascertained to contain a proportion of azote equal to that found in analogous parasitical vegetable organisms, appeared to warrant the conclusion that it really was of the nature of a fungus. Dr. Maclagan thought, however, that the question as to the nature of the potato-disease was not settled by proving the presence of a fungus in the altered portions. It was still a disputable point, whether the fungus was antecedent to, or consequent upon, the morbid state of the tubers; it was yet doubtful, whether the discrimination of the first advances towards the disease fell within the province of the chemist or the botanist. He had frequently observed, on making sections of affected potatoes, portions in the interior of the tubers in which no discolouration had commenced, but which were in a softened, pulpy condition. A portion of this could at once be lifted out on the point of a knife, and on being subjected to microscopic examination, no fungus or brown granular matter could be observed; but the amyloiferous cells of the tuber, and these contained starch grains, were found in a swollen state, as if they had been filled with fluid by endosmose, and the compartments of the cellular tissue had thus become so entirely detached from each other, as to

have assumed a complete round form, instead of their characteristic hexagonal shape. It appeared to him to resemble what might be expected from the maceration of the textures in water, and it was a possible supposition that this might be the first stage of the disease, and that the change thus effected in the tuber formed a nidus fitted for the development and growth of the fungus already existing in the aerial parts of the plant.

Mr. Milne being invited by the President to give his opinion, stated the gratification with which he had listened to the statements made by Mr. Goodsir and other speakers. Nothing could be more distinct than the description given of the nature of the fungus which appeared to accompany the disease, and the parts of the potato affected by it. The discussion, however, had been confined entirely to a description of the fungus, and to speculations on its probable effect in altering the condition of the potato. No one had, as yet, offered any opinion as to the circumstances which led to the production of the fungus. If it arose from seeds dormant in the potato, what was it which had caused them to germinate? If it arose from seed or matter in the atmosphere, was there anything in the state of the atmosphere to account for it in one part of the globe and not another? He had been devoting attention to the meteorological branch of the inquiry, and he thought that he had made a discovery which would explain the appearance of the disease in some places and not in others. But he had not come prepared to enter into particulars, not supposing that any persons, unless they were members of this Society, could take part in the proceedings; he would therefore indicate generally the results. Mr. Milne then described some peculiarities of the weather in England and Scotland during the summer and autumn of last year, as shown by meteorological returns which he had obtained from a number of places, both in those districts where the disease prevailed, and in those from which it had been absent. He mentioned that the maximum summer heat had occurred in England and southern parts of Scotland in June, whereas in the northern parts of Scotland, where the potato-disease had not appeared, the maximum heat had occurred in August, as usual. He alluded also to repeated and sudden thermometric changes which had occurred in the south of England.

Mr. Brand and Mr. Girdwood remarked, that potatoes in the early part of the season were not affected, and that where the stems and leaves had been cut away early, the disease had not appeared in the tubers left in the ground. These facts seem to indicate some atmospheric influences which had come into operation late in the season,

or some cause which did not take effect till the tubers were fully developed.

2. A Synopsis of the British Species of the genus *Rubus*. By Mr. Charles C. Babington, M.A., F.L.S., &c.

In this paper the author describes about thirty species of British *Rubi*, and numerous varieties. Several of the species are new to Britain, and for some the author is indebted to the researches of Dr. Bell Salter.—*W. W. E.*

Notice of 'Flora Calpensis.' By E. F. KELAART, M.D., F.L.S., &c., Army Medical Staff. London: John Van Voorst, 1846.

In the present day, when the advocates of fact and fiction are so nearly balanced, we hail this little work, in which facts only are detailed, as a valuable boon to the former. The 'Phytologist' may, with honest pride, claim the leadership of the *fact* party, and therefore *must* regard with approbation every attempt to add to the general store of knowledge. The celebrated remark of Savigny, that "Entomologists multiply observations to admiration but dispense with all attempts to generalize them," may perhaps equally apply to many botanists; but if so, it is far more creditable than the opposite extreme into which a few of our (self-styled) 'philosophical botanists' have certainly fallen, that of generalizing without a prior knowledge of facts. It was aptly said by Newton that "whatever is not deduced from facts must be regarded as hypothesis," but hypothesis appears to us a title too honourable for the crude guessings to which we allude. Such guessings we hold to be highly derogatory to the dignity of our science, and its great opprobrium as regards this country. Dr. Kelaart's work comes opportunely: it is full of information for the labourers in geographical Botany, while its unvarnished facts must of necessity militate against the wild speculations now rife on the same subject.

We know of no spot not absolutely an island more completely circumscribed geographically and politically than the Rock of Gibraltar. Seen from the beautiful bay which bears its name, the Rock, rising abruptly from the ocean, appears to be completely insulated, since the narrow sandy level which connects it with the main land of Spain is lost to sight and merges in the bright blue sea. The whole surface is irregular and rugged, and rises to a height of 1439 feet above the level of the sea. The entire area is estimated at two hundred acres, and of this about forty acres are cultivated as gardens and parterres.

The remainder, with the exception of that part occupied by the fortifications, is as nearly as possible in a state of nature. Although the distant appearance of the Rock would lead one to suppose its precipitous sides totally devoid of vegetation, this is by no means the case: "even as early as December the colour of the Rock is varied by luxuriant vegetation, though of a diminutive description, which changes with magical rapidity its summer dress and arid appearance immediately after the first falls of rain; masses of green of every tint, harmonizing beautifully with the yellow bloom of the Spartium and Genista and the fragile umbels of *Oxalis cernua*, which grows here almost wild. The whole appearance of the Rock, near the Alameda, is charming, and one who has not seen tropical vegetation would scarcely believe that at such a season Nature could look so beautiful."

In speaking of the *Chamærops humilis*, a palm very generally distributed over the Rock, our author indulges in a little zoological digression which is highly interesting. "Its tender leaves" says Dr. Kelaart, "and young roots constitute the principal food of the apes, which abound in this part of the Rock. The origin of this, the only quadrumanous animal in Europe, has been naturally the subject of many speculative opinions, and I regret to say that I cannot throw any new light on its history; but I am disposed to side with the opinion, that these apes were introduced into Gibraltar by the Moors, during their early possession of the Rock; for even in the present day similar apes are brought over from Barbary and sold in the market. Abyla, the hill on the opposite coast of Africa, is still called Ape's Hill, from the number of those animals seen there. The stationary habits of this animal on the Rock give additional interest to its history. There is no obvious reason why some of the apes should not have migrated to the neighbouring hills. The Queen of Spain's Chair, which is only three miles from Gibraltar, might afford them some diversity; but no,—they seem to prefer looking on their fatherland from the heights of Gibraltar, and feeding upon the palms which grow there, rather than travel to the fruitful valleys of Andalusia. They are never likely to be exterminated from the Rock, no person being allowed to shoot, or in anywise hurt them, unless they venture near the town, which they seldom do. Some years ago, one used to come down on the declivities above the Alameda pretty regularly, during the time the guards trooped, and it consequently went by the name of the 'Town Major.' The curious history of another of these apes is given by an 'Old Inhabitant,' in his very interesting 'Guide to Gibraltar;' who also very properly remarks, "where they bury their

dead it is impossible to say," for no one has as yet found the carcass of any on the Rock. Some think the lowermost caves their mausoleum, whilst others go even further in their surmise, and suppose that they carry their dead into Africa, through a subterranean passage under the waters of the Mediterranean." Returning to Botany we find that the proportion of flowering plants to ferns is greatly in favour of the former, the number of species being 446 flowering plants and 10 ferns, or nearly 45 to 1. Of the ten ferns enumerated, seven only were found by our author: of the remaining three, *Davallia Canariensis* is abundant on the oak-trees at Cork-wood, in the neighbourhood of Gibraltar, and perhaps this is really the habitat indicated by authors as 'Gibraltar:' *Nothochlæna lanuginosa* is given on the authority of Edmund Boissier; and *Asplenium Adiantum-nigrum* on that of Dr. Lemann. The seven ferns found by Dr. Kelaart during two years energetic search, are, *Cheilanthes odora*, *Gymnogramma leptophylla*, *Notolepeum Ceterach*, *Phyllitis Hemionitis*, *Adiantum Capillus-Veneris*, *Asplenium Trichomanes* and *Polypodium vulgare*. If we take Dr. Kelaart's own researches as the guide, the ratio will be 64 to 1.

In Britain, Mr. Watson supposes the number of truly indigenous flowering plants to be 1200 (see *Phytol.* i. 358), exclusive of the varieties which are *made into* species by recent authors. Mr. Newman has clearly shown that we have 40 distinct species of ferns, exclusive of *Cystopteris regia*, *C. dentata*, *C. alpina*, *Aspidium lobatum*, *Sm.*, *A. irriguum*, *Sm.*, *A. spinulosum*, *Sm.*, *A. dumetorum*, *Sm.*, *Asplenium fontanum*, &c. The authors who increase the number of flowering plants would probably increase that of ferns in the same ratio, so that take whose estimate we may, the proportion will be the same, 30 to 1. In Iceland the ratio is 25 to 1. In Belgium it is no less than 67 to 1. Hence it would appear that the Flora of Gibraltar, notwithstanding the apparent favourable site for the higher ratio of ferns, recedes to the low ratio of a completely inland country. The entire absence of the genera *Lastræa*, *Polystichum* and *Cystopteris* is worthy of notice.

Of the 456 species which Dr. Kelaart reckons truly indigenous to the Rock, 40 are generally distributed throughout Europe, 58 are natives of the south of Europe only, 63 are common to Europe generally and Africa, 174 to the south of Europe and Africa, 13 are confined to Spain and Barbary, 96 are common to Europe, Asia Minor and the north of Africa, and 12 are confined to Europe and Asia Minor. It should also be added that no less than 140 of the species

also occur in Britain, 170 in Madeira, as many in the Canary Isles, 79 in the Azores, 160 in Sicily, and more than 300 in Malta, one only, *Iberis Gibraltarica*, is peculiar to the Rock of Gibraltar.

Besides these, Dr. Kelaart has, and we think unadvisedly, included 44 species notoriously cultivated or introduced; such, for instance, as the Asiatic genus *Citrus*, four species of which appear in the list, *Melia Azederach*, the Cape *Oxalis cernua*, the Chinese *Eriobotrya japonica*, the American *Cactus opuntia* and *Magnolia grandiflora*, &c., &c. It is true that an acknowledgment accompanies each name, that the plant is found only in cultivation, but then they have no more claim to a place in the list than the ornamental shrubs and flowers introduced so abundantly in our English gardens, to a place in the British Flora. It is difficult to say on what principle Dr. Kelaart has made his selection, since the plants he has thus introduced constitute but a small part of those to be found in the elegant gardens of Gibraltar.

The relative number of species in the different orders is scarcely such as we should have expected to find. There are 60 Leguminosæ, or nearly a seventh part of the entire phænogamous Flora, and only 1 Saxifrage: there are 56 Compositæ, or an eighth of the entire Flora and only 25 grasses. The number of Cruciferæ is 17, of Caryophyllæ 19 and of Umbelliferæ 28.

In conclusion, we cannot but consider this unpretending *brochure* a valuable addition to our knowledge of the geographical distribution of plants.

K.

Notice of the 'London Journal of Botany,' No. 51, dated March, 1846.

(Continued from page 467).

No. 51. — The contents are, "Botanical Information," "Remarks on some rare Mosses of the southern Hemisphere," by W. Wilson, Esq., "Contributions to the Botany of South America," by John Miers, Esq., continued from the former volume. There is little of interest to the exclusively British botanist in the present number. The "Information" consists of the south African tour of C. L. Zeyher, and a letter from Mr. Richard Spruce, describing his doings in the Pyrenees. Though not botanical, the following passage from Zeyher's

notes appears best worthy of extract : " We arrived towards evening, at the side of a range of hills, called 'Zuureberg.' * * The name indicates the acid or sour quality of its pasturage, and was given by the farmers. It is a curious fact, that the sourness of a pasture is always indicated by the cattle chewing bones, which they never do when the grasses are quite sweet ; they know by instinct, what remedy to take for neutralizing the acidity in their stomachs. It was very interesting sometimes, to see our oxen chasing each other to get hold of a bone out of the mouth of another. The farmers believe, from ignorance of the true state of things, that the cattle use these bones to sharpen their teeth, and generally affirm that the teeth of cattle become sensible and painful from the sour nature of their food, while the fact is, they chew and swallow the bones as a cure for the internal acidity, which would not be a remedy against the painful sensation of the teeth."

The writer does not mention any of the sour plants which are thus supposed to make the oxen of Africa emulate the paupers of Andover by becoming "gnawers of bones." How is it with the English cattle when turned into pasturage abounding with *Rumex Acetosa* or *acetosella* ?

Mr. Spruce intimates that he has been highly successful in collecting mosses, notwithstanding the unfavourable reports about the Pyrenean mosses given by other botanists. His letter bears the date of January 6th, and it would seem that he designs to prolong his sojourn in the Pyrenees to another season.

C

Notice of the 'Annals and Magazine of Natural History,' Nos. 101 to 111, July, 1845, to March, 1846.

(Continued from page 224 of this Volume).

The 'Phytologist' has long been in arrears with its notices of the botanical papers in the 'Annals,' through necessarily giving priority to those contributions on British Botany which have been sent to us in the form of original articles. The papers in the 'Annals' may be thrown into two principle categories,—first, the original articles, relating chiefly to British plants—secondly, the articles translated from foreign publications, many of which are valuable contributions to physiological or geographical Botany.

No. 101.—This is the "Supplementary number" to the volume ending with June, 1845. It contains no botanical papers, except in the reports of the "Proceedings of learned Societies," in which we find a short account of Mr. E. J. Quekett's "Examination of some Fossil Woods, which tend to elucidate the structure of certain tissues in the recent plant," from a paper communicated to the Linnean Society.

No. 102. — "On some species of *Cuscuta*," by Charles C. Babington. "On the British *Desmidiæ*," by John Ralfs. "On the colours of Leaves and Petals," by William E. C. Nourse. "Observations on the group *Schizopetaleæ* of the family of *Cruciferae*," by J. Marius Barneoud (translated from the '*Annales des Sciences Naturelles*,' for March, 1845). "On the tendrils of the *Cucurbitaceæ*," by M. J. Payer (also from the '*Annales*,' same number).

Among these papers we give the preference to that of Barneoud, not only as a valuable contribution to structural Botany, but also from its bearing upon taxonomy. Of late years, unfortunately, there has been an increasing tendency to impose unnecessary difficulties in the way of the student who seeks to acquire a knowledge of plants *as individual objects*. This is always the starting point of human knowledge. The first words spoken by a child, with any appreciation of their meaning, are nouns or names of individual objects around him, whether of persons or things. The beginning of Botany, in like manner, is to know plants by sight, and to know one kind from another. Doubtless this is an unreasoning kind of knowledge; but every botanist feels it to be pleasurable in its kind, and it is a needful preliminary to any subsequent process of reasoning in Botany. It is highly desirable that the acquisition of such knowledge should be rendered as easy as possible, without the sacrifice of clearness and precision. This is, however, rendered difficult, not easy, when the distinctive characters of plants are drawn from minute parts. And great confusion of ideas can hardly fail to result, when genera and species, which are closely alike in all the more obvious characters, are widely separated in our systems, through strictly following some one or two almost invisible and arbitrarily selected characters.

The example which is brought prominently forward in the remarks of Barneoud, will be much less familiar, and therefore less apparent to British botanists, than one taken from our own Flora; and we will venture upon a few lines of digression, by making some of our own species of *Scirpus* (*Linn.*), into precursory examples, before quoting the remarks on *Schizopetalon*. Every student of British Botany

must be aware of the close similarity between *Scirpus palustris*, multi-caulis, pauciflorus, cæspitosa and acicularis. There is also a strong general similarity between *Scirpus maritimus*, *sylvaticus*, *triqueter* and *lacustris*, which resemble each other much more than they resemble any of the first-mentioned five species. Nevertheless, in Smith's 'English Flora' we find the four last united with two of the others (*pauciflorus* and *cæspitosus*) into one genus, *Scirpus*, the remaining three retaining the generic name *Eleocharis*, under which Hooker includes all the five. This disjunction of species closely alike one another, and conjunction of two of them with species to which they have much less resemblance, arises from strict adherence to a singly selected character, namely, the base of the style being slender or dilated.

The sectional or the generic characters among the Cruciferae, Umbelliferae, Compositae and other orders, are too frequently founded upon minute characters, difficult to observe, and leading, after all, to disjunction of resembling plants, and conjunction of those which are less similar. This is strikingly shown in the small group of Schizopetaleae. "Nature" says Barneoud, alluding to A. P. De Candolle's embryonal classification of the Cruciferae, "appears to have created the group of the Schizopetaleae to prove how little stable are frequently the majority of those sections or subdivisions of family which are not founded upon a totality of characters of affinity, as the true natural method requires. In the herbarium from Chili we find six species of Schizopetalon, of which five are new. If we study these plants with care before dissecting the seed, we are led to arrange them all in the same genus; all have a perfect similitude in the various organs of the flower, the same aspect, and nearly the same habit; in a word, we find an almost uniform plan of generic structure. The anatomy of the seed then demonstrates a considerable difference between several of the species. We find on the one hand, very minute globular seeds presenting an embryo with four linear and spiral cotyledons, with curved radicle, evidently belonging to the Spirolobae of De Candolle; and on the other, oval seeds, larger than the preceding, their embryo with two incumbent, spathulate cotyledons, and with an almost straight dorsal radicle, evidently belonging to the section Noto-rhizeae. This is the most striking character of the new genus Perreymondia. Now it is quite plain that it is impossible to separate, without violating the laws of natural affinity, in the methodical distribution of the Cruciferous plants, these two genera (Schizopetalon and Perreymondia), so nearly related, and solely distinct as respects the embryo, as it would be necessary to do according to the classifi-

cation of De Candolle." Thus we see, that the minute and difficult character has not even the advantage of exactness or natural-ness to compensate for the difficulties which it puts in the track of the student,—and all botanists are students to the end of their lives : no one learns all plants. Put down Mr. Babington on the shores of the Falkland Islands, and Dr. Hooker on the coasts of Britain, each would be sadly at fault, but change their positions, and they find themselves among their familiar acquaintances in plants.

In the paper on *Cuscuta*, more interesting to the observers of British plants, Mr. Babington describes three species, all of which might likely have been "lumped" under the one name of *C. Epithymum* by less close observers of Nature, and two of them, indeed, certainly have been so. First, we have the common *C. Epithymum* of our heaths, reduced in its comprehensiveness. Secondly, *C. Trifolii* (Bab.), a species carved out of the former, and on fair enough characters, provided they prove constant when examined by persons less inclined to subdivide. Thirdly, *C. approximata* (Bab.), said to have been imported from the East Indies with seeds of *Melilotus officinalis*; and this has still clearer characters for distinction. The paper is illustrated by figures, which greatly assist in explaining the differences of these three species. Their assigned characters run thus :—

- 1.—*C. Epithymum* (Murr.). Clusters of flowers bracteated, sessile, *calyx campanulate*, shorter than the tube of the corolla; its segments ovate, corona appressed; its lobes (scales) subequal to the *cylindrical tube of the corolla, rounded at the apex*, fimbriated, *convergent approximate at the base*; stigmas filiform.
- 2.—*C. Trifolii* (Bab.). Clusters of flowers bracteated sessile; *calyx infundibuliform*, subequal to the tube of the corolla, its segments lanceolate; *interstices of the corona saccate*, its lobes *half the size of the tube of the infundibuliform corolla*, rounded at the apex, fimbriated, *convergent, distant at the base*; stigmas filiform.
- 3.—*C. approximata* (Bab.). Clusters of flowers bracteated sessile, *calyx campanulate fleshy*, somewhat shorter than the tube of the corolla, its segments broad, truncate and apiculate or rhomboidal; corona appressed, its lobes *broad appressed*, slightly shorter than the *cylindrical tube of the corolla, bifid, with divergent segments*, fimbriate at the apex, *approximate at the base*; stigmas filiform.

The object of Mr. Nourse's paper, is that of pointing out those

"mechanical or structural" conditions on which the colours of leaves and petals are in part dependent. These are, he writes, "1st, the situation of the coloured cells; 2nd, their size, form and number; 3rd, their intermixture with each other, and 4th, their degree of visibility. He distinguished the parts of a leaf or petal into three, namely, "the *substance*, consisting of cellular tissue and venous ramifications, the *cuticle*, or epidermis, and a layer of cells immediately beneath the cuticle, to which we may give the provisional name of *rete*." Mr. Nourse states that "the situation of the coloured cells is different in leaves and petals, though their general structure is anatomically similar." He adds that in petals the *rete* "contains the entire colouring; the yellow, red, blue, brown, black, and all the intermediate tints are wholly produced in its cells, and can be completely removed by simply stripping it off with the cuticle." He also considers that "in leaves the *rete* is the seat of all the modifications of the green colour which those organs present, excepting variegation, cuticular changes, and what may be called vinous colours, like red cabbage, &c." But he says that the green colour of leaves is itself in the substance of the leaf, while in petals the *substance* is "either white or lightish, or some faint shade of the general colour of the flower." We suspect — nay, we are assured by individual observation — that there is some error in the observations of Mr. Nourse, or, rather, he may have observed correctly, and yet may have compared incorrectly. It would lead us into an incompatible length of detail, were we to go fully into this question; but a single fact will probably suffice as a hint to Mr. Nourse himself. There is a pretty dwarf tulip often brought into London in flower-pots, between Christmas and spring, and familiarly known to gardeners under the name of the 'Duke Van Thol.' Its colour is orange-red, with a bright yellow margin. If Mr. Nourse will strip off the cuticle from both sides of a petal, he will remove the whole of the red colour, through the adhesion of the *rete* to the cuticle. The whole *substance* of the leaf will then be found of a bright yellow colour, similar to the yellow margins of the entire petal. It is true the colour of the margin of the entire petal is somewhat brighter, but this appears to be only because part of the yellow colouring matter of the margin is situate in the *rete*, and the greater thickness of colour (in the *rete* and *substance* together) is seen through a transparent and shining membrane, namely, the cuticle. We may safely assert, with this easily-reached fact before us, that the general law of position of colour is the same for leaves and petals. Doubtless there are flowers in which the interior *substance* of the petals is pale, but

these are not to be selected for comparison with leaves, independently of those other flowers in which the *substance* is richly coloured.

No. 103.—“A list of the scarcer amongst the Lichens which are found in the neighbourhood of Oswestry and Ludlow, with occasional observations upon some of them,” by the Rev. T. Salwey. “On the British Diatomaceæ,” by John Ralfs, Esq. “Botanical notices from Spain,” by Moritz Wilkomm (a continuation of the translation from the *Botanische Zeitung*). “British Association for the advancement of Science; section of Zoology and Botany.” “Miscellaneous; *Ranunculus Lenormandi* (F. W. Schultz). *Carex montana* (*Linn.*). On the spores of some Algæ, by M. Gustave Thuret.”

The occurrence in England of *Ranunculus Lenormandi* and *Carex montana* has been recorded in former numbers of the ‘Phytologist’ (*Phytol.* ii. 289 and 467), and no farther comment appears necessary.

As usual, the proceedings of the British Association are characterized rather by the dearth than by the abundance of botanical interest. The Rev. L. Jenyns read a paper “On the turf of the Cambridgeshire Fens.” Sir R. Schomburghk read a description of the Ita palm of Guiana. Professor Henslow exhibited a specimen of *Papaver orientale*, in which the filaments were converted into bodies bearing ovules. Professor Allman adduced a monstrosity occurring in the flowers of *Saxifraga Geum*, first brought into notice and cultivation (as we believe) by Mr. William Andrews. Writing here from recollection, we do not quite agree with the description and explanation put forward by the learned Professor; but the difference of view is not greatly important, and may wait renewed examination of the plant. Dr. Allman’s report of the fact runs thus: “The three external verticils of the flowers were normal, but between the stamens and pistils there was developed a series of adventitious carpels, crowded upon the margin of a cup-like production which surrounds the lower half of the pistil. These adventitious carpels were characterized by their backs being turned towards the axis of the flower. The carpels bear ovules on their margins, which acquired a considerable degree of development, becoming completely anatropous, like those in the normal ovary.”

The longest report is devoted to Mr. Forbes’ communication “On the Endemic distribution of Plants.” There is a good share of clever ingenuity manifested in the geologic hypothesis of the learned botanist of King’s College, and as it is made to appear based upon botanical facts, it will doubtless be received by those who are slenderly acquainted with the actual present distribution of plants, and who are

unprepared to separate what is true and borrowed from what is original and imaginary, in the botanical foundation of the paper. For our own individual part, we must confess a great distaste for *ad captandum* articles hastily got up after the manner of Mr. Forbes's paper. We can find nothing for extract. "What is new is not true: what is true is not new." This aphorismal jingle of sound was never more justly applied than in the present instance. Still, unsound as we consider the paper to be, it is yet one which could never have emanated from an intellect of mediocre character. Regarded as a figment of the imagination, it is ingenious—as a contribution to science it is only vicious.

No. 104. — "Observations on some plants obtained from the shores of Davis's Straits," by William Seller, M.D. "Botanical Notices from Spain," by Moritz Willkomm.

We have yet so incomplete a knowledge of Spanish Botany, that the papers of Moritz Willkomm, sketchy and scrap-like though they be, are still well worthy of being published, and we rejoice to see the Editor of the 'Annals' thus rendering them more accessible to the English readers. Of course we cannot rely implicitly on the names given to the plants observed during botanical tours. Subsequent and more leisurely examination usually leads to corrections in regard to specific names, and it is probable that some such alterations will be required in those applied by Willkomm.

No. 105. — "On the *Glyceria fluitans* and *G. plicata*," by Thomas Moore, Esq. "On the surface of the Stem and contents of the medullary cells of *Nuphar lutea* (*Smith*)," by Julius Munter (translated from the *Botanische Zeitung*). "Report on a memoir by M. P. Duchartre, entitled 'Observations on the Orgonogeny of the flower of the *Malvaceæ*,' by MM. Brongniart, Richard and De Jussieu." (translated from the *Comptes Rendus* for August, 1845). "Botanical Notices from Spain," by Moritz Willkomm. "On the officinal species of Pepper," by M. Miguel, (taken from the author's '*Systema Piperacearum*'). "Obituary: Professor Graham, of Edinburgh," by J. H. B.

It is a rather remarkable circumstance that the two forms or species of *Glyceria* should never have been distinguished, even as varieties, by the botanists of England, who have latterly become so alert in finding and recording varieties and describing them for species. Closely alike as these plants are in general habit and the more obvious characters, they certainly offer quite as clear peculiarities for specific distinction as may be found in many other couples of closely allied

species, received as such. It has been said that discoveries of new plants are matters of chance, and they are so in a certain light. But to see that one thing differs from another, and to know that it is something new, are not matters of chance only. It requires good observation, and the previous possession of knowledge, to profit by a chance, and we therefore give credit to Mr. Moore for his discovery, postponing our decision upon the validity of the species for a more extended examination of their characters in the living plants. The more branched panicle of *G. plicata*, with its shorter outer palea, distinctly divided into three teeth at the tip, are sufficiently obvious distinctions from *G. fluitans*, in the dried examples distributed by Mr. Moore. Other differences are pointed out by Mr. Moore and Mr. Babington, though these are less obvious in the specimens.

The "J. H. B." subscribed to the obituary-notice of the late Dr. Graham, doubtless indicates his successor in the chair, himself gifted with much the same popular qualities by which Dr. Graham was honourably and amiably distinguished; and, we may add, with a far better general knowledge of Botany to start from. The botanical appointments made by our government, have seldom been appropriate, but we fear that this defect appertains also to those made by other patrons, so that we can make no special charge against the highest powers. Too frequently men are appointed to academical chairs or other offices of emolument and honour whose knowledge of Botany is of the slenderest kind, while in other instances good botanists are unfortunately selected to fill situations which are totally out of the circle of their actual attainments. Though the late Dr. Graham did afterwards acquire a respectable amount of botanical knowledge, to meet the exigencies of his position, there can be no question about the impropriety of his appointment to a botanical chair at a period when his Botany had yet to be learned. Dr. Thomas Brown held the office of Lecturer on Botany in Glasgow, before Dr. Graham. "Before retiring" writes Dr. Balfour, "he asked Dr. Graham to lecture for him, which Dr. Graham declined to do, urging as an apology the inadequacy of his botanical knowledge; but ultimately he was prevailed on to read Dr. Brown's lectures. On the resignation of Dr. Brown, the Crown instituted a distinct Chair of Botany, and conferred it on Dr. Graham, who was in the habit of referring to this appointment as an unexpected event, on which his future success in life depended." Considerately and delicately as this passage is worded, it nevertheless exposes a gross abuse of patronage, such as cannot be

charged against our present government in their selection of the recently appointed Professor in Glasgow.

No. 106. — "On the fructification of the genera *Clathra* and *Phallus*," by M. Maurice Lespiault (translated from the 'Annales des Sciences Naturelles,' for July). "Journal through Java, descriptive of its Topography and Natural History," by Dr. Fr. Junghunn (translated from the 'Botanische Zeitung'). "Miscellaneous."

No. 107. — "Remarks on some forms of *Rubus*," by T. Bell Salter, M.D. "Anniversary Address of the President of the Linnean Society." "On the existence of Tetraspores in a genus of *Algæ* belonging to the *Zygnemata*," by M. Montagne.

We would recommend Dr. Salter's introductory remarks on the uncertainty of species in the genus *Rubus*: they are rather too long for our space at present. Formerly Dr. Salter appeared in the character of a describer of *new* species; when we half suspected him of intending a little playful satire upon Messrs. Borrer and Babington, in giving their names to two of his new species, with a third bearing the significant name of "*tenuis*." At any rate, intended or not intended, he "hit the right nail on the head," for we have few botanists more inclined to accept, if they do not make, new species on *slender* grounds. In this number we have Dr. S. taking the side of the "lumpers," and swamping species in the most remorseless manner.

"The majority of the forms," writes Dr. S., "eighteen in number, are of the value of *varieties* only, and where this is the case, it does not appear needful to give any description of the character of the species, but only of those points in which the variety differs from the normal form. This applies to the first six plants; for the description of the species to which these belong, I would refer to Babington's 'Manual.' The last two forms constitute a species which I have long observed in the Isle of Wight; and the ten intermediate ones, which now appear grouped as three species, are plants about which the greatest confusion has existed, both as to the number of species they really constitute — each being by many held to be a species — and also as to the naming of them, their names having been transposed in almost every supposable change." The truth is, that no two botanists agree (as far as our own opportunities go) in applying names to *Rubi*, unless those who hunt in couples, or constantly exchange specimens, so that each may know what thing the other intends by any given name. Even this pairing and comparing will not always suffice, as we have seen proved experimentally. Nor is it likely it should always prove sufficient for uniformity; for the same botanist

who names a set of Rubi in 1843 or 1844, will re-name the same forms differently in 1845. This is also a proved fact with a botanist who is one of those best known as a describer of British brambles.

No. 108. — The "Supplementary number" for the latter half of 1845, is nearly filled by a zoological paper, only five pages being devoted to a partially botanical article, namely, Dr. Junghunn's "Journey through Java."

No. 109. — "Contributions to the Physiology of Fecundation in Plants," by G. Dickie, M.D., &c. "Journey through Java," by Dr. Fr. Junghunn.

No. 110. — "Remarks upon the formation of Starch," by M. Charles Muller (translated from the 'Botanische Zeitung,' for December, 1845). "On the relations of the genus Noggerathia to living Plants," by M. Adolphe Brongniart (translated from the 'Comptes Rendus' for December 29, 1845). "Botanical Notices from Spain," by Moritz Willkomm.

No. 111. — "Notes on the natural habitat of the common Potato, and on its introduction to Europe," by George Ord, Esq., Philadelphia. "A Synopsis of the British Rubi," by Charles C. Babington, M.A., &c. "On the development of Starch and Chlorophylle granules," by Carl Nageli (from a memoir on *Caulerpa prolifera*). "Botanical Notices from Spain," by Moritz Willkomm. "Agrimonia odorata, *Aiton*," by C. C. B. "On the disease of the Plantain," by George R. Bonyun, M.D.

Mr. Ord concludes that the true potato (*Solanum tuberosum*) is indigenous in South America, and not found in North America except under cultivation, and that it was brought into Britain by Drake. The wild potato of the North American States is the *Apios tuberosa* of Pursh.

Mr. Babington's Synopsis of the Rubi will of course be hailed with satisfaction by the botanists who delight in these endlessly varying shrubs. We do not mean to write in terms of disrespect to those very acute observers of plants, Mr. Borrer and Mr. Babington, in expressing a supposition that botanists of *their school* (right or wrong as may turn out) will gradually carve out as many species of *Rubus* as have been carved out of *Salix*; and that eventually it will be found so impossible to identify them by descriptions, that they will be recombined into some half-dozen probable species. The allied genus, *Rosa*, has been dragged through a similar course, by being split into a host of book-species, inseparable and undistinguishable in Nature; but these are fast dropping into disregard or oblivion; and so, we opine,

will it fare with "sixty three" species of *Rubus* long before the end of this century.

Of *Agrimonia odorata*, of Aiton, we are compelled to confess entire non-acquaintance, unless an indifferent Cornish specimen shall prove an English representative thereof. The specific character given in the '*Hortus Kewensis*' amounts to no character at all as a distinction from our ordinary *A. Eupatoria*. The *A. odorata* is said to be a larger plant, with deeper-coloured flowers, leaves hairy and glandular beneath, not cano-tomentose, calyx less furrowed, and with the lower spines reflexed. The latter character exists in the *pressed* specimens of *A. Eupatoria*.

C.

Note on the Disappearance of Plants in certain Localities.

By THOMAS MEEHAN, Esq.

MANY botanists cannot have failed to observe that certain plants often exhibit a remarkable degree of inconstancy in some localities with regard to quantity. Sometimes a locality which is known to produce a large quantity of any given species, will barely produce a handful; sometimes it will even totally disappear in that, and reappear in no situation near the other. Usually, however, if they disappear in one locality, they may be found in some situation near to the former one, which occurrence may perhaps be termed a migration. The following example may probably illustrate this better: it is a case of the *Sisymbrium Sophia*, which, in a work I have now before me by Dr. Pulteney, '*Catalogues of the Birds, Shells, and some of the more rare Plants of Dorsetshire*,' published in 1813, is stated to "be met with near the Ferry, on the Ham side of the water, at Poole," but now, and I am indebted for the knowledge of this fact to Dr. Bell Salter, it may scarcely be met with there, but is in great plenty in a situation a little distance from this.

Circumstances may often be met with in the Isle of Wight, which bring these observations repeatedly before the memory, and which incite the ardent admirer and devoted lover of Nature to an investigation of the causes that may lead to such curious results.

There are many plants that certainly existed in the Flora of the Isle of Wight that are now missing; and there are many that have been reported to exist by various accurate observers, that have hitherto been vainly sought for. Among the former may be mentioned An-

chusa sempervirens, *Atropa Belladonna*, *Lathyrus maritimus*, *Mentha piperita* and *Teucrium Chamædrys*; and among the latter *Cineraria campestris*, *Diotis maritima*, *Gentiana campestris*, *Gnaphalium sylvaticum* and *Scilla verna*.

The circumstances I would more particularly narrate have for their subject the *Chlora perfoliata*. It was in 1841 that I first became acquainted with this plant, which was then growing plentifully on the calcareous clay on the sea-shore between Ryde and St. Clare. In consequence of a notice which I saw, — I think in Mrs. Loudon's 'Ornamental Annuals,' I was desirous to obtain seed of it for cultivation in the flower-garden, but when the blooming season in 1842 came, there was not a plant in existence. In 1843 the same thing occurred, and I suppose I was satisfied with the idea, that the sea had washed away all the soil on which the plants grew, for I thought no more on the subject. However, in 1844, while strolling over the clay, I was agreeably surprised to observe plants in bloom in the greatest abundance. During the past year, 1845, I frequently searched for it, but the whole number of plants found was three, and these so starved and melancholy looking, as rather to excite pity than admiration.

In this narrative there are two things worthy of being taken into consideration: the great decrease in the quantity or total disappearance of the plant in some seasons, and the vitality of the seeds. The first of these subjects will be attended in its examination with some little difficulty, because the same effects do not happen to the same plants in different localities, for, while the plant was scarcely found last season at St. Clare, it might be found in great abundance on the chalky ground and dry banks at Carisbrook. If the same effect had been observed in both places, if the plant had been equally scarce at Carisbrook as at St. Clare, we should have admitted, as good presumptive evidence, that some atmospheric peculiarity had been the acting cause; and the constitutional nature of the plant, which is well known to gardeners to be impatient of moisture, would have materially strengthened the coincidence between the disappearance of the plant and the cold and wet season of 1845, and between its plentifulness and the warm and dry season of 1844.

But while it is evident that we may not look to the atmosphere alone for a solution of our subject, we may take it into consideration in connexion with the state of the soil in each separate locality, and if we find that there is a great and manifest degree of difference between the two, we may not look for equal results from them, even

though they may be under *exactly* the same atmospheric conditions : these considerations are necessary to be borne in mind in the present examination, because, as I have already stated, there is a great difference between the soils of the stations mentioned. I am unable to adduce anything, either *pro* or *con*, for the disappearance of the plant in 1842 and 43, in consequence of a want of sufficiently attentive observation. But in 1844 the season was remarkable for an unusual amount of dryness, which had the effect of well drying the usually over-saturated clay on the sea-shore ; and consequently the seed of *Chlora perfoliata* were in the conditions necessary for germination. In the past season the effects on the clay have been the reverse, and hence the non-appearance of the plants.

The fact of seeds preserving their vitality for a long time in the earth is well known, and the present case of seeds of *Chlora perfoliata* having remained for three years in the soil without germinating, only adds one more item to our stock of useful knowledge.

THOMAS MEEHAN.

St. Clare, Ryde,
March 4, 1846.

Remarks on certain Plants growing near Fareham.

By W. L. NOTCUTT, Esq.

It was my intention, in communicating to your periodical some time since, a list of the plants found in the vicinity of Fareham, Hants, to have followed it by a paper containing a few remarks upon certain of the species therein mentioned, but a variety of circumstances have hitherto prevented by making the attempt. The present paper I therefore commence with the view of carrying out my intention, and I trust that the desultoriness of my observations will be pardoned. I may first notice a few typographical errors which should be corrected, as they would mislead any botanist who inquired for the places as printed. In pp. 203—8 "Cams" should be read instead of "Carns." In the remainder of the list it is correct. P. 204, l. 39, "Paxol" lane should be "Puxol" lane. P. 205, l. 31, Redenham should be Bedenham, and p. 205, l. 41, "Warsath" should be "Warsash," "Mrs. Robinson" should have been printed instead of "Mr. R." *Hypericum tetragonum* ought to have been *H. quadrangulum*. *Viola tricolor* should have added to it *β. arvensis*, the normal form not being

found near Fareham, as far as I am aware. The localities printed for *Ranunculus aquatilis*, β . *panthorix*, belong to *R. fluitans*, and the locality for the former is Chark Common. Three plants have been accidentally omitted from the list, viz. :—

Potamogeton crispum. Pond at Uplands.

Chenopodium murale. Under a wall at Lower Quay.

Fagus sylvatica. Common.

Thus much for errors.

A very interesting feature in this list is the fact that it contains some plants which appear, as far as is hitherto known, to be entirely absent from the Isle of Wight, a district in the immediate vicinity, though some of them grow at or near Hill Head, which is opposite the shores of the island and only four or five miles distant. Thus *Glyceria aquatica*, *Scirpus lacustris*, *Matricaria Chamomilla* and *Cardamine amara* are, I am informed by Dr. Bromfield, thus absent from the island Flora, while they are truly wild in the localities indicated for them in the list, and, except the second, in tolerable plenty. Specimens have been communicated to Dr. B. as verifying the correctness of the names. The case may be reversed, and there are doubtless *many* in the Isle of Wight which are quite absent from the neighbourhood of Fareham: thus, *Anthemis Cotula*, though the pest of farmers on the island, I never could find about Fareham, though we had both *A. arvensis* and *A. nobilis*. Another curious fact is the almost total absence of two common species, *Draba verna* and *Arabis Thaliana*. They are both included in the list, I having found a plant or two of each, far advanced in seed, on a wall at the iron-mills, Fontley; yet as common plants they may be considered as absent. The absence of such common plants from particular districts is very interesting, and in this case also it stands in contrast to the Isle of Wight Flora, for in that district the *Draba* is very abundant. *Potamogeton natans*, *Papaver dubium*, *Bidens cernua*, *Scutellaria galericulata*, and *Chrysanthemum segetum* are among other common plants which appear to be absent from the district, not, however, for want of suitable situations for their growth. Of the last, I once found a specimen, but I expect it had been dropped with some corn accidentally.

Oenanthe pimpinelloides as marked on my list, is, I have no doubt, the plant of Linnæus. Its roundish-ovate tubers at a distance of an inch or more from the base of the stem — its fruit and inflorescence, together with its habitat, all concur in marking it as the true plant; and Fareham will therefore afford a new station for it. In “the Salterns” its chief companion is *Genista tinctoria*, and in the field at

"Cams" plenty of *Silene pratensis* springs into flower when the *Oenanthe* has vanished. My observation of the plant at Fareham enables me to corroborate Dr. Bromfield's account (*Phytol.* ii. 241) of the uncertainty of its appearance. In 1843 it was abundant in the Salterns, and in 1844 not a plant was to be found there, while in 1844 it was plentiful in the field at Cams, where I had not previously seen it. A similar instance is mentioned in an interesting work, 'Wild Flowers of the Year,' in the disappearance of *Spiranthes autumnalis* from a field at Tunbridge Wells in 1844, where, in the previous year it was extremely abundant. It seems desirable that those plants should be noticed which are subject to these periodical disappearances, and, as far as can be, the causes traced. I have in a former paper mentioned *Thlaspi arvense* to possess such a character.

The oxlip (*Primula vulgaris*, β . *caulescens*) grows, though very sparingly, in a copse at White-dell; and here I found it in a curious state, of which I had previously heard, but never before had an opportunity of observing, viz., true primroses and oxlips (β . *caulescens*) growing from the same root. There were several specimens which exhibited the same phenomenon.

Carex extensa, which grows in great plenty at Cams, just a little further from the edge of the water than *Statice rariflora*, puts on a cæspitose appearance, which I have not seen noticed. It grows in tufts or stools of considerable size. In the Salterns, where there are a few plants of it, it does not assume this character. At Cams it has to push its way through shingle, and it grows in a clayey soil full of pebbles: this may perhaps have some influence on its mode of growth.

In gathering a quantity of specimens of *Pyrus communis* to be dried as duplicates, from the only wild specimen in the district, I noticed a curious circumstance after bringing them home, a distance of about two miles; on turning them out for the purpose of putting them in press, I observed that they possessed a very offensive odour, exactly like that of *Chenopodium olidum*, only not in so powerful a degree, and having no other plants with me at the time, it could not have originated with another plant.

Potamogeton plantagineus is very abundant on Titchfield Common, and I think it will eventually be found to be no uncommon plant in boggy situations. I remember seeing it at the new reservoir, Daven-try, Northamptonshire, in great plenty, though at the time I was unacquainted with it.

The radiate variety of *Centaurea nigra* is very abundant: is this

only a variety? I am inclined to think that it has quite as good claims to be considered a species, as some which, in these hair-splitting days, have that honour. Is it not peculiar to the *south* of England? Of that variable plant, *Scolopendrium vulgare*, there is a curious variety at Place-house, but it is scarce. The frond is rather stunted, irregular in the outline, and *minutely* crisped or plaited only just on the edge: the var. *crispum* is a very different form, the frond being waved in rather large folds, which extend almost to the midrib.

Respecting *Equisetum Telmateia*, I may perhaps contribute a remark or two bearing on the discussion respecting its habits, which appeared in the first volume of the 'Phytologist.' At Fontley it is abundant on banks of earth and clay which have been thrown up from excavations on the South-western railway, which passes close by. Ponds have been formed in the hollows between some of these banks, and the *Equisetum* grows both *on* the banks and *down to* and *within* the margin of the water. I gathered several specimens in flower, which were growing in the water where it was three or four inches deep. In Gill copse, where it also grows, there is one part of the copse which is quite swampy, and in winter is covered with water, and there, and there alone, grows the *Equisetum*. In every instance where I have seen *Equisetum Telmateia*, it has always been on marshy ground. I have certainly never seen it in what could be called a dry situation. The driest was on the upper part of the banks at Fontley, where it is stunted, not being more than twelve to eighteen inches high, while in the swamp in Gill copse I have seen it four or five feet high.

In a shallow pond in the same situation with the *Equisetum*, at Fontley, grows *Ranunculus fluitans* in abundance, and presenting exactly the same appearance as in a rapid stream, where the swiftness of the current might appear to have caused its peculiar appearance. In this pond, however, the water is quite still, and there is no current to cause the different character which it displays from *R. aquatilis*.

The neighbourhood of Faversham, in Kent (of which the Flora has been published by Mr. Cowell), appears to be very similar to that of Fareham, both in geological character, in physical aspect, in the number of plants ascertained to inhabit the respective districts, and in the degree of latitude. A comparison of the two Floras shows a singular correspondence and yet a remarkable difference, as will appear from the following analysis:—

I.—Herbaceous plants.		Fareham.	Faversham.
1.	Growing on dry land, such as heaths, pastures, meadows, &c.	- - 310	323
2.	Growing in woods and shady places	41	50
3.	„ salt marshes - -	32	29
4.	„ sandy shores - -	1	1
5.	„ water, immersed, floating or standing in water - - -	27	26
6.	„ marshes, bogs, ditches &c.	86	69
II.—Trees and shrubs.			
1.	Growing in marshes, bogs, &c.	- 10	7
2.	„ woods, hedges, &c.	- 41	39
		548	544

Plants growing at Fareham, not hitherto observed at Faversham 126

„ Faversham, not hitherto observed at Fareham 120

This great difference renders it probable that many of the species may be common to both, though not yet detected. I have not appended the lists, as that would take up too much of your space: should you think them of any value, I could forward them another time.

W. L. NOTCUTT.

[I MAY perhaps be allowed to add a note to Mr. Notcutt's observation on *Centaurea nigra*. In Herefordshire the radiate variety of this plant is very abundant, much more so than the normal form. The radiate form has a greater partiality for hedge-banks and ditches than the normal form, which prefers pastures; but occasionally they occur in the same field, growing side by side. Under all circumstances, the difference seems marked and decided, and I have often been inclined to ask with Mr. Notcutt, "is this only a variety?" I need not inform so able a botanist as Mr. Notcutt, that the radiate plant is usually considered a species on the continent, whence it comes labelled as *C. nigrescens* of Willdenow, whose description is very clear and intelligible. Our English authors unite these two plants without expressing even a doubt, a circumstance rather to be admired in Mr. Babington, whose aversion to the multiplication of species is not often exhibited. — *E. Newman*.]

Note on the English Localities for Cerastium alpinum.

By HEWETT C. WATSON, Esq.

IN the February 'Phytologist' (Phytol. ii. 423) Mr. James Backhouse records the finding of *Cerastium alpinum* on Striden Edge, Helvellyn; and he adds, "a plant frequently met with in Scotland, but not, that I know of, recorded in any *botanical* work as a native of England." There would have seemed more justice to his predecessors, had Mr. Backhouse looked into the *most likely work* for ascertaining the fact, before sending the remark for print. The same locality, of the Patterdale side of Helvellyn, was recorded in the first volume of the 'New Botanist's Guide,' ten years ago, on the authority of the late Mr. Winch's manuscript notes — a most industrious and generally correct compiler of botanical localities in the northern counties. In the Supplement, printed in the second volume of the same work, the locality is explained more specially by the mention of "Striden Edge," on the authority of Mr. Joseph Woods, who, indeed, was the original informant of Mr. Winch, so long ago as 1828. Mr. Woods first, I think, published that locality in Hooker's 'Companion to the Botanical Magazine,'¹⁸⁴⁷ A Lincolnshire locality is copied into Turner and Dillwyn's 'Guide;' and it is re-copied into the 'New Guide,' though as one probably erroneous. The same species has been repeatedly recorded as a Caernarvonshire plant; but Mr. Backhouse may not consider that locality sufficiently an English one, even in contrast with the Scottish Highlands. I communicated these facts to Mr. Backhouse, in the hope that he might correct the error himself. but in reply, that gentleman writes, "Thou art quite at liberty to rectify my mistake in the 'Phytologist,' and it may be well, at the same time, to correct another of my blunders of a similar character, where, at page 894, it is stated that *Polemonium cæruleum*, which is found in Teesdale, was *new* to that district, whereas we afterwards noticed that it had been previously found by John Bell, of Middleton, in Teesdale. See 'Phytologist,' page 741."

HEWETT C. WATSON.

Thames Ditton,

February 26, 1846.

Borrera flavicans discovered in Fruit near Penzance.

By ALFRED GREENWOOD, Esq.

I HAVE great pleasure in communicating the discovery of the fruit of *Borrera flavicans*, which I found some days ago in an orchard, in the neighbourhood of this town. I first brought home a single specimen, not being aware, at the time of gathering, that it was in fruit. Afterwards Mr. Ralfe and myself succeeded in getting in the same and surrounding orchards about seventeen more: most of these had from one to three apothecia upon each of them, but a few were more thickly fruited, and one specimen had, I believe, as many as one hundred shields upon it.

I understand there is only one recorded instance of the fruit of this lichen having been previously found in Britain: this was a single specimen gathered by Mr. Lobb in the eastern part of the county. It is now at Truro, in the herbarium of the Horticultural Society of Cornwall.

Even the barren specimens of the *Borrera* are valuable, from the size which they attain in some of these orchards; indeed, the fruit-trees are so covered with different species of *Parmelia*, *Usnea*, &c., that frequently but little of the bark can be seen, and many of the smaller branches are quite destroyed by these epiphytes. The appearance thus given to the orchards struck me as peculiarly characteristic of the country on my first arrival from Essex, where the trees are comparatively free from this nuisance, for such it is to the gardener, although it adds to the beauty of the scenery, and is interesting to the botanist, particularly when he finds among the lichens such a rarity as *Borrera flavicans* in fruit.

A. GREENWOOD.

Penzance, March 14, 1846.

Note on Hieracium pulmonarium. By WM. BORRER, Esq., F.L.S.

I AM glad to learn from the remarks in the 'Phytologist' (ii. 442), that Mr. Watson has come independently to the same conclusion as myself respecting *Hieracium pulmonarium* of Smith, viz., that it is identical with the plant which we regard as *H. nigrescens* of Willdenow. I believe that Mr. Babington, too, now agrees with us. My opinion has reference to the specimens which I gathered in 1810, from rocks by the river Nevis (or Nivis) from one of which the figure in

'English Botany,' t. 2307, was drawn. I believe it is distinguishable as a species from *H. alpinum*, but it is certainly more nearly allied to it than to *H. murorum*.

This is far from being the only one of the genus, even among our comparatively few British species, that is, as yet, imperfectly understood, although some of them have been much written about. I will hope for additional light when we have Mr. Watson's further remarks on those which he is cultivating.

W. BORRER.

Henfield, March 2, 1846.

P.S. — I have one more error to correct in the list of mosses, p. 436 of the present volume.

The supposed *Bryum mnioides*, from Helvellyn, is, as I thought it at first, *B. punctatum*. The Malham plant is the true *B. mnioides*.

W. B.

Notes on the Ranunculus Lenormandi of Schultz. By HEWETT C. WATSON, Esq., Mem. Imp. Acad. Cæs. Leop. Nat. Curios.

IN Mr. Babington's 'Manual of British Botany,' a variety of *Ranunculus hederaceus* is mentioned, under the name of "*grandiflorus*," distinguished by having petals "broad and much longer than the calyx;" but no mention is made there respecting any peculiarity in the leaves of that variety.

In the 'London Catalogue of British Plants,' a variety of *R. hederaceus* is entered under the name of "*partitus*." That Catalogue not being descriptive, of course only the name occurs; which was suggested by the plant having an intermediate form of leaf between the ordinary *R. hederaceus* and the *R. tripartitus* of De Candolle.

In the 'Annals' for last year (xvi. 141) we find an account of "*Ranunculus Lenormandi*, *F. W. Schultz*," which is there identified with Mr. Babington's variety '*grandiflorus*;' and the following description is given of it:—"It differs from *R. hederaceus* by each lobe of its leaves bearing two or three notches, its carpels obovate and tipped with a terminal style, petals broader and longer, stipules very broad and scarcely at all adnate to the petiole. It is a considerably larger plant than *R. hederaceus*, and has probably been overlooked in England, as either that species in a vigorous state, or perhaps as a state of *R. aquatilis*, from which the want of capillary-divided leaves, and the absence of setæ on the receptacle, distinguish it."

In the 'Phytologist' for February (Phytol. ii. 423) Mr. James Backhouse mentions his having found a variety of *Ranunculus hederaceus* "with remarkably large flowers" near the head of Coniston Water, which was new to him, but probably the variety named 'grandiflorus' by Babington.

Mr. Backhouse obligingly sent me a specimen of his Coniston plant; at the same time informing me that Mr. Babington had recognized it as his variety 'grandiflorus.' This specimen has shown me that the variety 'partitus' of the London Catalogue is identical with Mr. Babington's variety 'grandiflorus,' which I was fully prepared to believe; though Mr. Babington takes great care that I shall not get from himself any authentic examples of his newly recorded species or varieties. Thus, the three names — *Lenormandi*, *grandiflorus*, and *partitus* — are synonyms of each other. Whether regarded as a species or as a variety, it will be advisable to adopt the name of 'Lenormandi' for this plant; that of 'grandiflorus' having been long applied as a specific name for an Asiatic *Ranunculus*, which has really large flowers.

I have a specimen brought from Cumberland twelve years ago; and have frequently observed the plant about Esher and Claygate, in this neighbourhood. I should say that the most obvious difference between the ordinary form of *hederaceus* and *Lenormandi*, is found in the latter having the lobes of its leaves more deeply divided, in addition to the secondary notches or lobes, which gives it considerable resemblance to *R. aquatilis*. The flower is certainly larger than usual with *R. hederaceus*; but it is still small when compared with that of *R. aquatilis*, in its usual size. I cannot say that *Lenormandi* is a larger plant than *hederaceus*. I have seen the latter both larger and smaller than any examples of the former. Though I have often looked at the two plants, where growing intermixed, I could never satisfy myself of their distinctness as species; and, indeed, I have sometimes felt uncertain to which of the two some examples should be assigned.

There is still a third form of *R. hederaceus*, which grows out of water, and is distinguished by its more deeply divided, almost deltoid, and divergent lobes of the leaves, the flowers varying in size, but less than that of *Lenormandi*. On the other side, I have seen some specimens of *hederaceus* with reniform and entire leaves.

HEWETT C. WATSON.

February 25, 1846.

P.S. — I beg leave to send two additional remarks, by way of post-script to my notes on *Ranunculus Lenormandi*, which has been brought before the readers of the 'Phytologist' by Mr. Babington's paper, of an earlier date than mine (*Phytol.* ii. 467); and which I did not see before the 6th of March. When Mr. B. writes that "the first notice of it as a native of Britain is in the 'Annals of Natural History,' xiv. 141," he must only intend to say the first notice of the *name* "*Lenormandi*,"—one of very recent origin. The *plant* itself had been recorded as a native of Britain, both in his own Manual and in the London Catalogue.

Secondly.—I fear that the characters mentioned by Mr. Babington will not be found sufficiently discriminative. But this point must be determined by examination of the living plants. In specimens glued to paper, as are most of those in my herbarium, it is not easy to decide whether the stipules are a little more or less adnate; but in some loose examples of *Lenormandi* I find them certainly adnate for one-third to one-half of their length; and, moreover, varying considerably in breadth. Again, I cannot find much difference in the position of the style, when fruits are compared together at equal stages of growth. At a very early stage, the style is more distinctly terminal in both; but it is rendered apparently lateral, by the obliquity (or unequal enlargement of the two sides) of the fruit in its advance towards maturity. The question therefore arises, whether the alleged difference in the position of the style has been discovered only by comparing the fruit of *Lenormandi* in an earlier stage with that of *hederaceus* in a later stage of development? Half a dozen pods of the common garden pea, at different ages between the flower and maturity, will illustrate this change in the position of the style, by the unequal growth of two sides of a fruit;—allowance being made for the difference between a roundish and single-seeded fruit, and the elongated pod of a pea.

H. C. W.

March 7, 1847.

BOTANICAL SOCIETY OF LONDON.

March 6, 1846. — Edward Doubleday, Esq., V.P., F.L.S.; in the chair.

Donations to the Library were announced from the American Philosophical Society, Mr. G. Rich and Mr. W. Pamplin. Dr. Gilbert M'Nab presented some plants from Jamaica.

The following plants were exhibited :—

1. *Sisyrinchium (anceps?)*.—Communicated by the Rev. H. L. Jenner, by whom it had been received as an indigenous Irish plant, collected in a wood near Woodford, county of Galway. The specimens were past flowering, but the genus is certain, and the species probably correct. If truly native, this will be another added to the short list of plants common to America and the British Isles, but unknown in Europe, unless as naturalized plants.

2. *Ranunculus Lenormandi*, Schultz.—Communicated by Mr. James Backhouse, from the head of Coniston Lake; also by Mr. Hewett Watson, from Esher Common, Surrey. This has been long known, but has usually (and perhaps correctly) been considered a variety of *R. hederaceus*. The Esher specimens are larger, and less like *R. hederaceus* than are those of Coniston. It is the variety "partitus" of the 'London Catalogue.' [See Phytol. ii. 467, 497].

3. *Erica Mackaii*, Hook.—Seven specimens selected from others communicated by Mr. Mackay. They were selected in order to show that Mackaii passes into *Tetralix* by intermediate forms, which illustrate the gradual change of habit and character.

4. *Glyceria fluitans*, Br., and *G. plicata*, Fr.—Communicated by Mr. Moore, from a field near Hampstead, to illustrate the differences between the (reputedly two) species. [See Phytol. ii. 484].

5. *Saxifraga umbrosa*, Linn.—A numerous series, selected from others communicated by Mr. Mackay and Mr. Andrews, illustrating the gradual change in the character of the leaves, from the crenate form found in Yorkshire and on the Pyrenees, to the very acutely serrate form named "serratifolia." Of this latter there is a duplicato-serrate sub-variety, which Mr. Andrews sends under the name of "Ogilby's Saxifrage."

6. *Enanthes*.—A selection from the specimens collected by the Rev. Andrew Bloxam and Mr. Lees, in 1845. The specimens of *Lachenalii* sent by Mr. Lees, had the roots broken short, so that no thickness or tuber-like portion appears. The roots of Mr. Bloxam's plants of *Lachenalii* were whole, and mostly showed a very decided thickening at one to three inches below the base of the stem. One of these had short and fusiform roots, precisely of the same character with the roots of Mr. Lees' examples of *peucedanifolia* or *silaifolia*, showing indisputably that the root alone would not distinguish the two species. Two of Mr. Lees' specimens of *pimpinelloides* (Linn.) had most different roots, although both were in the early flowering stage: in one the knobs were numerous, and so fully grown as to

look like large beads on a thread; while in the other the roots might have passed for slender forms of *Lachenalii*, except for a single half-grown tuber on one of them. Internally the roots of *pimpinelloides* are tough and fibrous at maturity, requiring an effort to break them; while those of *Lachenalii* are very brittle. The Society has now a very full series of these three species.

Read, "Remarks on the roots of *Cœnanthe Lachenalii*, from ditches at Yarmouth, Norfolk, collected in January, 1846," by Mr. George Fitt. Specimens were presented.—*G. E. D.*

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, March 12, 1845. — Dr. Balfour, President, in the chair.

Donations to the library and museum were announced, viz., from W. Brown, Esq., R.N., 'Harvey's Genera of south African Plants;' Dr. Cullen, a list of Plants found in the neighbourhood of Sidmouth; Mr. H. Ibbotson, a catalogue of Plants found in the north Riding of York; and from Mr. W. Gillespie, plants collected on the shores of Hudson's Bay, in latitude 57° N. The thanks of the Society were voted to the respective donors.

The following communications were read:—

1. — "On the altitudinal range of the Mosses in Aberdeenshire." By George Dickie, M.D., Lecturer on Botany in the University and King's College of Aberdeen.

2. — "Remarks on the state of the Sibthorpean Herbarium at Oxford, suggested by the announcement of a new edition of the '*Flora Græca*.'" By Dr. R. C. Alexander.

3. — "Botanical Excursion in Lower Styria in 1842." By the same.

Dr. Alexander stated that he had been persuaded by his friend, Dr. Maly, of Gratz, to take a tour through Lower Styria in 1842. "A country that had been little explored by botanists, though seeming to claim their especial notice. Situated in a degree of latitude almost the same as that of the middle of France, at the base of the great central alpine group of Europe — three branches of which terminate in this province; — and on the eastern side exposed to the influence of the great plain of Hungary, where the winter is as cold as in the Steppes of Russia, and the summer as hot as the warmest parts of Italy or Spain, it might be expected to evince in its vegetation the effects of a

climate so modified." The excursion commenced about the beginning of May and lasted till the end of July; during which time Dr. A. was enabled to make a large and valuable collection of plants, including several species new to Styria. Specimens of the more interesting species were exhibited to the meeting, the Society's herbarium having been enriched by a very complete set through the kindness of Dr. Alexander, and were greatly admired for their beauty and the excellent manner in which they have been preserved.

A letter from Dr. Bidwell, Albrighton, was read, announcing the discovery of *Vaccinium macrocarpum* near Mold, in Flintshire, in August last, as stated in the 'Phytologist' for March (Phytol. ii. 441); and from Mr. W. A. Stables, noticing the discovery of *Neottia nidus-avis*, in Cawdor Woods, Nairnshire.

Dr. Balfour exhibited specimens of diseases in plants caused by insects; one of these consisted of peculiar stipitate excrescences on the leaves of a North American tree; concerning which Dr. B. read some extracts from a letter which he had received from Mr. Adam White, of the British Museum:—

"The swellings on the leaves of the plant seem to be caused by some species of plant-louse; one kind is very hurtful to the peach tree, but attacks the leaves in a different way to the insect on your specimen. Dr. Harris, in his admirable work on the Insects of Massachusetts injurious to vegetation, speaks of some Aphides, 'the punctures of which affect plants in a most singular manner, producing warts or swellings, which are sometimes solid and sometimes hollow, and contain in their interior a swarm of lice, the descendants of a single individual, whose punctures were the original cause of the tumour. I have seen reddish tumours of this kind as big as a pigeon's egg, growing upon leaves, to which they were attached by a slender neck, and containing thousands of small lice in their interior.' Possibly the excrescences may be caused by some minute moth (Tortricidous or Tineidous), as there are evidences of some little larva that has eaten away the parts between the cuticle at the base of some of the excrescences. Your specimens I have examined, but do not find any fragments of the insects, although there are traces of dung, and a small part of a web, certainly remains of a moth, and there is no reason why the excrescences may not be the nidi for the eggs of an *Eriosoma* (an aphidious insect), and the web, dung and eaten part, evidences of some *Tinea*. Mr. Doubleday has observed similar warts on leaves, but knows not how they are produced."—*W. W. E.*

*Remarks on *Enanthe Lachenalii*.* By GEORGE FITT, Esq.

THERE being some discrepancy between the statements of Messrs. Watson and Lees in the 'Phytologist' respecting the form of the roots of this plant, I thought that if I could obtain some Yarmouth specimens, they would perhaps throw light on the subject in dispute.

Most of the roots which I had seen differed considerably from that figured by Mr. Lees; and Mr. Watson having, for the most part, figured only single tubers, I felt sure that the roots of our Yarmouth plant were not described in the papers of those gentlemen.

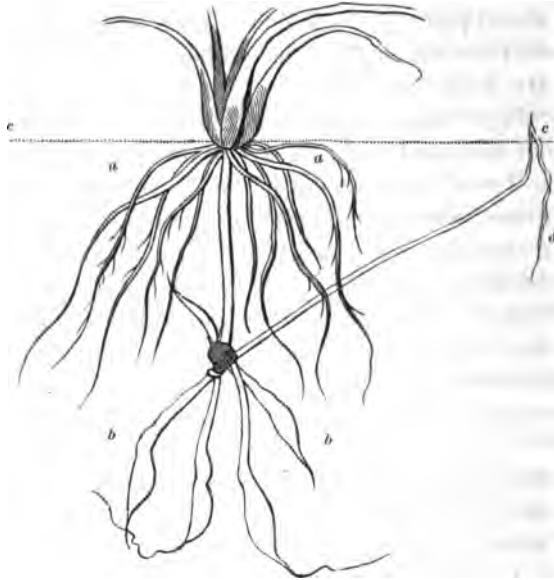
At the time I read their remarks, the ditches in which our plant principally grows, were covered with ice: by breaking it, however, I succeeded in obtaining a few small roots, which I found by the leaves appearing beneath the surface of the water. Of these specimens I sent a few to each of the above-named gentlemen. The ice having entirely disappeared a few days after, I easily obtained a larger supply, a selection from which, now in Mr. Newman's possession, have already been alluded to on the cover of the 'Phytologist' of last month.

The first thing apparent in these is the constant presence of tubers intermixed with fibrous roots, but on closer inspection the tubers are found to be attached to the withered stem of last season, and the fibrous roots to be of a more recent growth and proceeding from an offset, now in course of development, and which is to be the plant of next season. This may be proved by any specimen; for simply by the pressure of the finger the offset will break from the old stem, which will then be found adhering to the tubers, and the fibrous roots proceeding from the offset. In some instances the tuber appears to have been buried an inch or two beneath the surface of the mud, to which it has sent up a stem, and where a whorl of fibrous roots have been produced. This will be clearly understood by a glance at the annexed figure, selected from many similar ones, as best showing this peculiarity, as well as the twofold character of the root. The specimen itself is now in Mr. Newman's hands.

The upper portion of this root, *a, a*, which might be easily separated from the lower, if caution were not used in taking it up, represents the fibrous root of *Lachenalii*, as figured by Mr. Lees, and the lower portion, *b, b*, resembles his figure of *peucedanifolia*. In those roots which have not sunk beneath the surface of the mud the offsets grow out of the woody crown which unites the tubers, and then the two kinds of root are mingled together, and their different age is not

so apparent, unless the new ones are broken off in the manner already described.

I have now in water nearly 100 roots : amongst them is every variety of form from the nearly fibrous, described by Mr. Lees' figure, to



a, a, Root of *Lachenalii* according to Mr. Lees.
 b, b, *Do. peucedanifolia* do. do.
 c, c, Surface of mud.
 d, Old Stem withered and fallen.

others which include all the forms figured by Mr. Watson in the 'Phytologist' (Phytol. ii. 398), as *peucedanifolia* and *Lachenalii*, as well as most of that gentleman's figures of *pimpinelloides*, p. 397. It may be observed that in all the former kind (that is to say, those most nearly resembling Mr. Lees' figure), there is the evident disposition to become tuberous, most of the roots being in a state of transition where not already tuberous.

This twofold character of root can hardly be peculiar to the Yarmouth and some few other stations, although it would appear to be so from the testimony of some correspondents in the 'Phytologist,' but who have, I suspect, possessed themselves of only the upper portion of the roots, from not having taken them up with sufficient care. I am the more inclined to this opinion, because some of my large fibrous roots lately taken up agree with Mr. Lees' figure of *Lachenalii*, not only in form, but in the presence of fibrillæ; and because many, if

not all, the mature specimens which I have dried, have had roots more or less inclined to be tuberous. It must not therefore be inferred that the form of my roots is owing to the season at which they were taken up. The following circumstance quite disproves such a supposition, and shows, moreover, that the root of our Yarmouth plant is essentially tuberous. In the summer of 1844 I took up a large root without stem, consisting of several tubers, and carried it home for examination. Something caused me to forget it and it lay a month or more in water before I again noticed it. One of its tubers had then been broken off at about half its length from its connexion with the stem, and the lower or detached portion had thrown out leaves from two of the eyes with which the tubers are studded. No appearance of stems was visible, owing, I imagine, to the tuber not having been buried, but fully exposed to light while lying in water. This specimen I showed to Dr. Lindley last summer.

The following appears to be the process of formation in the root of *Lachenalii*: originally a fibre, it swells for a portion of its length commencing at a little distance from its lower extremity, and gradually tapering upwards. The lower extremity itself remains unaltered, and is the terminal fibre of the tuber, just like that represented in Mr. Lees' figure of *peucedanifolia*, the tuber of which is doubtless formed on the same principle.

In the 'Penny Cyclopædia' is a cut of *Œ. crocata*, showing a *fibrous* root *above* the tubers. The expense of engraving forbids the introduction of more figures here.

I have dried forty-four roots for the Botanical Society, and to describe them it will be sufficient to refer to the figures already shown in the 'Phytologist.' They may be classed as follows:—

Eight, exhibiting the peculiarity of the annexed figure.

Three, large, coming near to Mr. Lees' figure, but agreeing rather with his description (*Phytol.* ii. 358), in "thickening gradually towards the posterior end." The old stems are attached to these.

Six roots, some having tubers six inches long, and including all the forms of such figured by Mr. Watson. Old stems remaining.

Two roots, large; tubers thick at the lower extremity, so much so in one as almost to appear stalked, resembling Mr. Watson's *pimpinelloides* (*Phytol.* ii. 397), the third figure from the right hand. Old stems remaining.

Nineteen smaller roots, of various sizes, including every form, even that of the Basle specimen, given by Mr. Watson as *Lachenalii*. Most, if not all, of these have produced stems.

Six roots found in a cluster, matted together, very small, which are probably seedlings; they have generally a double tuber-forked downwards.

In all my specimens the thickening of the roots varies much in the same plant; generally the medium sized roots are the stoutest in proportion; the larger being more inclined to the slender form, although there are many exceptions to this.

One of the roots sent to Mr. Newman has a peculiarity which I have seen in only three or four instances. It is similar to the annexed figure, except in one respect, that is, the withered stem of last year, which is still remaining, proceeds from the upper part of the subterranean stem at the base of the offset, instead of from the crown of the tubers, as seen in the engraving. This makes the tubers a season older than the stem of *last* year, and proves that they do not always wither annually. Indeed, to judge from *two* other roots amongst my specimens, they appear to be capable of three or even four years duration. One of them has the ascending shoot, to the left of the annexed figure, of last years growth, with the old stem attached to it, and just below where its fibrous root may be supposed to have grown, is a single tuber still remaining. The other ascending shoot has this winter produced an offset.

In the second specimen there is only one ascending shoot, and which has tubers at the lower end, one tuber half way up, and an offset at the surface. Now if the fibrous root is produced in winter or in early spring and becomes tuberous during the summer, these two plants were produced thus: the lower tubers were fibrous in the spring of 1844 and tuberous in the autumn. The second tuber was fibrous in the spring of 1845, and matured in the following autumn. The present fibres are of recent growth, and will be tubers next autumn; the plant will then have existed during three seasons at least.

I have been thus particular in my statements, because it may be an assistance to others who may feel disposed to pursue the inquiry still further, which I hope to do myself. My plan in taking up the roots is to dig out as large a lump of mud as will contain the whole root, and then to *wash* it away, the only method to avoid fracturing the tubers.

Of the rest of the plant I cannot say much at present, except that some of the lower leaves, at this early season, are decidedly bi-pinnate.

Mr. Lees has kindly sent me specimens of his *pimpinelloides* and *peucedanifolia*. I have met with nothing like the former, and scarcely

anything which could be mistaken for the root he sent me of the latter, taken as a whole.

Amongst the numerous specimens here alluded to, are some so much stouter in all their parts, and having the remaining old stems so much more strong and woody than others, that I feel inclined to attribute it to some other cause than accidental luxuriance of growth. It may be found in the age of the plant—and this I shall endeavour to ascertain by the examination of other roots.

Geo. Fitt.

Yarmouth, February 10, 1846.

P.S.—I have planted about twenty roots, both tubers and fibres, in pots, where I shall endeavour to bring them to the flowering state for the examination of their roots.

G. F.

Notice of the 'London Journal of Botany,' No. 52, dated April, 1846.

(Continued from page 478).

THE contents of this number are, "Contributions to the Botany of South America," by John Miers, Esq. (continued from the preceding number). "Description of a new species of Bolivaria," by George Bentham, Esq. "On *Koniga intermedia* of the Canasy Islands," by P. B. Webb, Esq. "On a new Fern from Java, detected by Mr. Thomas Lobb." "Botanical information." "Contributions towards a Flora of Brazil, being the distinctive characters of some new species of Compositæ belonging to the tribe Vernoniaceæ," by George Gardner, Esq.

With the exception of the "Botanical Information," these contents will possess interest only for the technical botanist who devotes himself to the species and genera of exotic plants. The "Information" comprises a short notice of Dr. Lindley's new work 'The Vegetable Kingdom,' an advertisement of Mr. Lobb's Javanese plants, collected for sale, and a continuation of Mr. Geyer's Notes on the plants of the Missouri and Oregon territories. From the notes of Mr. Geyer we extract a further corroboration of a natural fact which has been observed in other parts of America. It would be well if other travellers would also give examples, by name, in support of the alleged facts.

"It is a curious fact" says Mr. Geyer, "that while the forests are left undisturbed, the remains are always composed of such or such kinds in almost unchanged proportion. Not so when fire has swept over, and has destroyed the pristine races of trees; then others spring up, which were either not at all there, or in the minority. So, where *Pinus ponderosa* is removed by fire, *Abies rubra* will fill that place to suffocation; if, after a few years it is burnt again, another tree takes the place." In Britain we have few opportunities for observing the effect of burning off arborescent species; but the natural covering of ericaceous shrubs is repeatedly burnt off the Highland mountains, and there the bared ground is soon re-occupied by the very same species; seedlings of *Calluna vulgaris*, &c., springing up plentifully among the fresh shoots from many undestroyed old roots. Frequently repeated burnings will effect a gradual change from *Ericaceæ* to *Cyperaceæ* and *Gramineæ*, when aided by the presence of sheep; for explaining which there are obvious mechanical and chemical conditions. It is more difficult to say why, where one species of pine has been destroyed by fire, another and different species shall forthwith occupy its room, though a careful observer of Nature would probably detect the true cause of this, if on the spot to seek for it.

C.

Correction of a mistake in Mr. Lawson's "Stray Thoughts," in the January No. of the 'Phytologist.' By HEWETT C. WATSON, Esq.

IF Mr. Lawson will again refer to the remark of mine in the January number of the 'Phytologist,' which he has written against on page 417, he will find that he has misconceived the meaning of the sentence. I remarked that something useful might be gleaned from the "poorest contributions among the rambles and visits;" but I did not say that the rambles and visits *are* the poorest contributions to the 'Phytologist.' There are valuable contributions to British Botany among that class of papers, though some of them are very trifling. The remark having been misread, Mr. Lawson's strictures upon it fall for want of basis.

HEWETT C. WATSON.

February 21, 1846.

On the identity of Nephrodium fœnisecii, var. alatum, of Madeira, with Lastræa recurva of Britain. By EDWARD NEWMAN.

THE *Nephrodium fœnisecii* of Mr. Lowe, like the *Polypodium cristatum* of Linnæus, the *Aspidium dilatatum* of Smith and the *Aspidium spinulosum* of Hooker, comprises that little group of species belonging to the genus *Lastræa*, the ultimate divisions of whose pinnæ are aristate or spinulose. It is, in fact, the Madeira representative of this little group. I will not here anticipate the conclusions of a paper long since written but still unpublished, on the exact nature of similarities existing between plants of distant countries, but merely say that the little group in question has been called *cristatum* in Sweden, *dilatatum* or *spinulosum* in Britain and *fœnisecii* in Madeira: its bounds in other parts of the world, particularly North America, where it still remains to be divided, the various names at present in use applying equally to all the species.

Mr. Lowe has, however, done more than Linneus or Smith (neither of whom indicate the existence of other species, by the mention of varieties); for he expressly describes two varieties under the names of *α. alatum* and *β. productum*, and I am indebted to Mr. Watson for calling my attention to the fact that the variety *alatum* possesses all the characters of our British *Lastræa recurva*; and a sight of Mr. Watson's specimens, which he has most kindly placed before me, has fully convinced me of the correctness of his views. It is, however, a fact worthy of remark, that Mr. Lowe has not made the slightest allusion to either of the three characters which immediately distinguish *recurva* from any other aristate *Lastræa*, although these characters are possessed by the Madeira specimens in a very pronounced matter: I allude to the minute, sessile, grain-like glands scattered over both surfaces of the frond: the jagged, eglandulose involucre: and the long, slender and lacinated scales of the stipes. Mr. Lowe's description is principally confined to the figure and cutting of the frond, characters which till lately obtained the exclusive attention of our botanists.

The var. *β. productum* is less distinctly marked, and may be supposed to contain the remainder of the aristate group. Among the specimens thus named, *Lastræa multiflora* occurs in a very pronounced state.

Mr. Lowe's descriptions are published in the fourth volume of the 'Cambridge Philosophical Transactions,' at page 7, and were read in 1830. They are reprinted verbatim below.

Gen. NEPHRODIUM, R. Br.

4. *Nephrodium fœnisecii*, *Prodr. Ms.*

N. Fronde triangulari vel ovata, 3—4 pinnatifida, utrinque glabra: laciniis (tertii quartique ordinis) oblongis, obtusis; ultimis incisis, mucronato-serratis; omnium inferioribus exterioribus internis oppositis majoribus: soris numerosis distinctis: indusiis primò semiovatis vel reniformibus, demum orbiculatis, emarginatis: stipite breviusculo, basi sparsim subpaleaceo, fusco, superne rachique pallidis.

α. alatum; fronde 4-pinnatifida; pinnis inferioribus (primi secundique ordinis) triangularibus vel ovatis, externis interioribus oppositis valdè majoribus: pari infimo pinnarum (primi ordinis) basi deorsum ramoso; pinnulâ (secundi ordinis) potissimum prima (aliquando etiam secunda) inferiore s. exteriore deorsum productâ.

Hab. in sylvis Vaccinii padifolii, *Sm.*, Maderæ; ubique vulgarissima.

β. productum; fronde tripinnatifidâ, paulò magis elongatâ: pinnis omnibus oblongis; externis internis oppositis vix majoribus: laciniarum ultimarum dentibus subaristatis.

Hab. in umbrosis humidioribus Maderæ; rariss.

β. Statu potius prioris (α), e loco obscuriore, defectu luminis, &c. quàm varietas videtur.

Frons in utraque varietate nana, 1—1½ pedes (una cum stipite) longa, ferè pedalis; 6-8 pollices lata: stipite vix dimidium totius longitudinis aquante. In utraque odor idem gratissimus fœnum novum redolens, constans.

Species *Aspidio dilatato* et spinuloso, *Auct.* certe proxima; et cum illis forsan, in unam speciem (ut ab amiciss. cl. Hookero) consociatis, olim conjungenda. Sed distingui posse credo, figurâ frondis abbreviatâ, deltoidâ; stipite brevior, minus (sc. basi tantum) paleaceo; pinnulis angustioribus, odore. His adde frondem magis decompositam: quamvis enim rarò, sc. in *β.* certè minus quàm in *α.* decomposita, in utroque tamen statu saltèm sub-tripinnata, et longè frequentius, sc. in *α.* statu normali, sub-*quadripinnata*. Hæc omnia, cum aliis characteribus suprâ indicatis, nullibus exemplaribus stabilita sunt; et in planta *α.* adeo per totam insulam pervulgata, constantia, nec in tantâ differentiâ loci cœlique (*β.* enim potius monstrosa) variantia inveni.

We now arrive at the question of nomenclature. We find that the species recurva has been previously described by Mr. Lowe as a portion of his *fœnisecii*: not "lumped in" without judgment or consideration, but carefully and advisedly included, and not only thus, but the author, evidently struck with its remarkable habit, has separated it

from the less marked forms and given it a name as a variety, and I presume from the text, he considers it the most marked or typical variety. We have thus two names positively identified with the plant now under consideration. The first of these, *fœnisecii*, is assigned to this species in common with others as a specific name, the second, *alatum*, is given it as that of a variety, and applies exclusively to this one species.

The name *fœnisecii* having been given to a group of species, and that group being the Madeira representative of *cristatum* or *dilatatum*, is objectionable on two grounds: in the first place it yields in priority to *dilatatum*, as this again to *cristatum*: in the second place, the name being applied to a group of species rather than to a single species, the choice of fixing it on either of the included species is a privilege, the exercise of which leads to inextricable confusion. In proof of this the reader is referred to Mr. Babington's ingenious but unsuccessful attempt to apply the names *spinulosum* and *dilatatum*, as an unanswerable proof that both those synonymous appellations should be discontinued, since it seems impossible to fix to which species either of them properly belongs. I would therefore suggest that the name *fœnisecii*, like its prototypes, should be altogether suppressed.

A remarkable instance of the impropriety of converting a patronymic into a specific appellation occurs in entomology. Linneus designated by the specific name *Puella*, that large genus of dragonflies which now forms the genus *Agria*. The name *Puella* is consequently equally applicable to *either* species provided it be an inhabitant of Sweden, and no entomologist knows how to restrict it.

Having thus attempted to dispose of the name *fœnisecii*, I have to consider the claim of the second name, *alatum*. This was advisedly and most properly restricted to one species, and that species possessing all the distinguishing characters of our *recurva*. It is, I think, a departure from the general practice, to give any leading or typical form a name distinct from that of the species. The usage is this: *Salix fusca*, var. *β. repens*, var. *γ. prostrata*, &c., &c.: var. *α.*, if it be not paradoxical to call the typical form a variety, is supposed to bear the name of *Salix fusca* without any addition. In the present instance, however, Mr. Lowe has taken especial care that *his* plant—for I doubt not that his description enjoys a priority of several years—shall bear a name; and yet with equal care has he provided that that name shall only be applied as to a variety: he purposely and advisedly mixes up two plants (in my opinion *many*, but avowedly, purposely and advisedly *two*); and with elaborate care, with singular

ingenuity, so constructs his description that it shall apply to both. When an author has thus taken great pains to show that his plant, although named, is only a variety, when he has been at the trouble of placing a specific name over it as if the more to enforce its restriction to the variety, surely the name of that variety cannot, by any law of botanical usage, be introduced to supersede a name accompanied by a specific description, and applied without doubt or hesitation to the same plant as a distinct species.

I may perhaps be allowed, before concluding this brief paper, to confess that the result of this inquiry has not been such as I anticipated; for from the moment Mr. Watson announced to me his discovery of the identity of the British and Madeira plants, I concluded to give up the name of *recurva*, since its adoption seemed rather annoying to some of my friends who had advocated a change. A candid investigation of the matter has been attended with a different result, and the present, like every other inquiry into the propriety of retaining the name *recurva*, seems to issue in establishing that name more firmly than before.

EDWARD NEWMAN.

9, Devonshire Street,
Bishopsgate, 13 April, 1846.

Botanical Ramble in Ireland. By CHARLES CARTER, Esq.

I VENTURE to give you a slight outline of a ramble through a part of Clare in July last. Business conducting me at stated times throughout the year, to the west of Ireland, and having occasionally many days of leisure, I thought I could not devote them to a better purpose than to the study of Nature. To such pursuits I have been led by the delightful excursions recorded in your excellent journal, by Professor Balfour to Ailsa Craig and the Mull of Cantyre, and by Mr. Keddie to the Bass Rock, but above all by that of Mr. Ogilby in my own localities, picturing so vividly and so poetically, beauties that many minds are wholly insensible to. His is the spirit of a true naturalist. I hate your dry pedantic lore—your freezing descriptions of Nature's works: very few are the converts to science made by such!

In September last, being with some friends in the neighbourhood of Clifden, I had heard of Mr. Ogilby, as an accomplished naturalist and botanist, being there. He had discovered another station for the

beautiful *Erica Mackaii*, a heath admired by all, but which that gentleman (who originally found it) I am informed now considers to be a mere form of the more common species; and his views are concurred in by his friend, the Professor of Botany in the Royal Dublin Society, one of the first indigenous botanists in Ireland.

About the 10th of July I walked from Oranmore to Kilcolgan, by a road which bounds the eastern end of Galway-bay, but not presenting much of interest. Proceeding to Ardrahan, the scenery becomes fine, and the limestone soil affords much for the inquiring botanist. Near Kittarton I was delighted with masses of the lovely *Gentiana verna*—the most beautiful of all our Gentians. It was in full bloom—

“Blue—blue—as if the sky let fall
A flower from its own cerulean wall.”

Here also I met with *Carduus nutans*, *Asperula cynanchica* and odorata, *Chlora perfoliata*, *Gentiana campestris* and *Amarella*, and a host of Galiums of all forms and sizes. In the romantic lake Teeneran grew *Butomus umbellatus*, and the rocks around were covered with *Lonicera* and *Hypericum Androsæmum*. Resting at Gort, I next day took the car which daily runs, during the summer, to New Quay, a sweet and retired bathing-place, about nine miles across the bay from Galway. Here the limestone shows itself in sterile grandeur around, being barren in the extreme. From New Quay I walked a distance of five miles round the creek to Ballyvaughan, a wretched little village. Such fare, and such a bed for a poor weary naturalist, who is only enlivened by a far too intimate acquaintance with hosts of the order Siphonaptera.

Getting clear at daylight of these loving friends, I trudged up a long and weary ascent to the top of Beal-na-thulloch, and then what dreariness is seen around! Towards Block-head were piles upon piles of large lime-stone blocks, and mass upon mass extended until lost in the thick mist that covered the headland.

Beyond the hill I saw the mountain avens (*Dryas octopetala*) abundantly in flower, the rock bramble with its bright red berries, and a few plants of *Cistopteris* and *Grammitis Ceterach*, with frequent tufts of *Saxifraga hypnoides*:—a wretched tract, however, for the botanist. In the evening I reached Ennistymon, a delightfully situated little village about two miles from the bathing place of Lahinch, and but four from the famous cliffs of Móhir. I never saw such specimens of *Erica cinerea* as grew around the rocky hills of the village. I have seen plants three feet in height, with corollas almost as large as in

Menzesia. The sand-hills of Lahinch are covered with *Asperula cynanchica* and *Viola lutea*, and numbers of plants peculiar to the sand hills of the west, amongst which I plentifully gathered *Polygonum maritimum*. From thence I journeyed by the coast to Miltown, passing by the cliffs near Spanish-point, where grows abundantly samphire, *Aster Tripolium* of a large size, *Lavatera arborea*, and many of the beautiful *Orchis* tribe.

My time being limited, I pursued my way from the hotel at Miltown Malbay, across the wild and exposed beach of Cassina, where enormous blocks of rock, of many tons weight, have been rolled up by the furious surges of the Atlantic. I turned up the deep defile, through which the little river Auna falls into the ocean—a river famed for its delicious white trout and fine salmon: its steep banks on either side were covered with a brushwood of *Salix caprea*, the hazle, *Prunus spinosa*, and a variety of *Rubi*. Opposite the romantically situated mill was the salmon-leap, where many a fine fish has been gaffed: the leap is over-shadowed by magnificent trees of *Salix pentandra*.

Crossing the bogs *en route* to Kilrush, I visited several of the numerous lakes that are spread over the great bog of Mon Mor: here I was rejoiced to meet in profusion the white water-lily (*Nymphaea alba*) and *Nuphar lutea*, called in Irish, Billeog bhaithe buidhe — the yellow drowning leaf. I explored several turloughs, but could nowhere see *Potentilla fruticosa*.

But what gave me the greatest delight was the discovery, in several pools in the bog, of *Eriocaulon septangulare*, which Mr. Mackay, in his admirable 'Flora Hibernica,' says is confined to Connemara; and with it, in a small lake, grew a species of *Elatine*, *Alisma natans* and *Lobelia Dortmanna*. *Rhynchospora alba*, a variety of *Carices*, the three species of *Drosera*, *Scutellaria minor* and *Radiola Millegrana*, were abundant in the bogs around, and the drains were filled with *Utricularia minor* and *vulgaris*. The luxuriance and beauty of *Erica Tetralix* were rich in the extreme; and had I not seen in my own county, the magnificence of *Menziesia*, and the delicate beauty of the compact and profusely flowering *Mackaii*, I should indeed have considered it surpassing.

My stay in Kilrush was but short, the steamer starting with the early morning tide for Limerick.

CHARLES CARTER.

Oranmore, Galway.

On the occurrence of Ranunculus Lenormandi at Godalming.

By HENRY BULL, Esq.

THE *Ranunculus Lenormandi* of Schultz, the *R. hederaceus*, β . *grandiflorus* of Babington, or the *R. hederaceus*, β . *partitus* of the 'London Catalogue,' by whichever name it is hereafter to be distinguished, is much more plentiful in this neighbourhood than the typical form of *R. hederaceus*, occurring on the margins of ponds and in ditches on the commons, and pending the inquiry, whether it is to rank as a species or is to be considered as merely a variety of *R. hederaceus*, I should feel pleasure in supplying specimens, as far as my stock will allow, to any reader of the 'Phytologist' who may think it worth while to write for them.

I do not observe, in any of the plants that I have examined, that the leaves of *R. Lenormandi* are variegated with the markings of darker green or brown, which are seen extending into each lobe of the leaf in *R. hederaceus*. The different form of the carpels in the two plants is very apparent, but the relatively more or less adnate state of the stipules I do not find to be so distinct.

HENRY BULL.

Godalming, Surrey,

April 16, 1846.

On the occurrence of Primula elatior (Jacq.), at Halstead, Essex.

By THOMAS BENTALL, Esq.

I HAVE much pleasure in recording the occurrence of *Primula elatior* (Jacq.), at Halstead, having recently met with it in small quantity in a damp meadow, at this place.

In this locality it is accompanied by a profusion of *P. vulgaris*, and where the two plants are growing intermixed I have observed specimens which I have no hesitation in pronouncing to be hybrids between them. The circumstance altogether has a little surprised me, knowing that most of the stations where *P. elatior* occurs, are characterized by the entire absence of *P. vulgaris*, and although the former is frequently accompanied by *P. veris*, I have never seen or heard of an example of hybridity between them.

It is well known that *P. vulgaris* will form hybrids with *P. veris* when they grow intermixed; in fact, the peasantry in this part of the

country not unfrequently resort to the practice of planting "paigles" and "primroses" together in their gardens in order to obtain these hybrid "oxlips," which they always cherish as objects of great curiosity from the novel way in which they go to work to procure them. I may just add, that there can be no doubt as to the Halstead plant being the true *P. elatior*. It is perfectly identical with authentic specimens from Bardfield and elsewhere, now growing in my garden; indeed, the plant is altogether so distinct in appearance from the hybrids between *P. vulgaris* and *veris* that they are not easily to be confounded.

THOMAS BENTALL.

April 16, 1846.

Scirpus (Isolëpis) Savii known and distinguished as a Species by our older English Botanists. By W. A. BROMFIELD, M.D., F.L.S.

THAT this plant, supposed to be a modern, and indeed, rather recent addition to the British Flora, was known to and well distinguished by at least a couple of our earlier botanical writers, is, I apprehend, clearly established on the testimony of Merrett and Parkinson. The latter, in the 'Theatrum Botanicum' gives us, at p. 1270, No. 9, a tolerably accurate figure, and on the next page a very fair, though brief description of *S. Savii*, under the rather cumbrous title of *Gramen junceum maritimum exile Plimostii*, or "small sea rush grasse of Plimmouth." He adds, "This was found as well at Plimmouth as Dover in their wet grounds." To this Merrett correctly refers at p. 55, of his 'Pinax,' a plant which he found "plentiful where a small drill issueth out betwixt the rocks, *near* the south east point of the Isle of Wight." This station accords with one of the most prolific of the localities for *S. Savii* in the island at the present day, namely, on the wet, springy, slipped land under the cliff at Shanklin, where it will be found in great abundance, particularly a little to the northward of the Chine, beyond the baths, growing in dense, cæspitose tufts, often above a foot in diameter, spreading or radiating in a circular form. Parkinson's figure represents the variety *β. monostachys*, the only one found with us here, where it is extremely common in wet, boggy places, especially along the coast, somewhat rarer in plashy spots on heaths, and in woods, &c., inland. Fig. 10 of the same page is evidently that of *S. setaceus*, as appears also by the description, in which

the comparatively fewer stems and larger and more compound (or, as he calls it "prickly") heads are quite discriminative of that species, by far the rarer of the two in this island.

W. A. BROMFIELD.

Ryde, Isle of Wight,
April, 1846.

Notes on the wild Currants of the Isle of Wight.

By W. A. BROMFIELD, M.D., F.L.S.

FROM those standard works on British Botany, the Floras of Smith and Hooker, it would seem that the red currant and its varieties are to be found truly wild only in the north of England and in Scotland, at least, if not so asserted in direct terms, it is by implication to be inferred that the same plant is to be met with in a merely naturalized state south of the Tees, or including its now acknowledged varieties, *R. petræum* and *R. spicatum*, not nearer to us than Yorkshire. Even those accurate and scrutinizing botanists, Mr. Babington and Mr. H. C. Watson, who take little or nothing for granted or without inquiry, seem to participate in the same opinion with the eminent authors before mentioned; Mr. Watson affixing to all the stations for *R. rubrum* in his Guide south of Yorkshire, the usual mark, either indicative of doubt or of positive certainty that it has been introduced into the respective localities by other than natural agency, whilst Mr. Babington says simply "woods in mountainous districts," which must of course be held to exclude all but the northern parts of England and Wales. That this opinion is erroneous, I have for many years past been convinced by finding the red currant in situations near Hastings, where it had perfectly the aspect of a genuine native, and since then have been the more confirmed in the truth of this view of the matter, by observing it in this island, over which it is very generally distributed, occurring frequently, and often most abundantly, not only in our hedge-rows and thickets of the enclosed country, but in the remotest recesses of all our hilly woods or deep boggy coppices, flourishing indifferently at the sea level and in the wettest soil, or at a few hundred feet of elevation, in ground comparatively free from moisture, though always in tolerably shaded, cool situations. It is, indeed, so common an Isle of Wight shrub, that there is scarcely a patch of copse or brushwood, however small, from which it is wholly

absent, and some of our larger woods produce specimens by hundreds.*

I am not disposed to attach any importance to the usual mode of accounting for the dissemination of naturalized species by birds dropping the seeds, because I take that to be the means which Nature mainly relies on for the propagation of species unfurnished with such mechanical contrivances for the ready conveyance of their seeds abroad, as we see in the pappus of the Compositæ, the dissilient capsules of many Euphorbiaceæ, the Oxalidaceæ, balsams, &c. She would avail herself of the like animal agency in the wilds of America or the virgin forests of Guiana, as in the well-peopled and cultivated fields of Europe. It is the extent and power of occupancy which must guide us in determining the indigenous origin of species amongst us, coupled with a careful inquiry into their geographical distribution elsewhere,† which last will often clear up doubts and overcome our scruples when nothing else would arise to do so.

Unless it can be shown that a species did not formerly exist where it now grows in abundance, such hypothetical appeal to the fowls of the air will not advance us a step nearer to a settlement of the point at issue. But I have an additional reason, which I shall now state, for believing the red currant to be truly indigenous to this and other of our southern counties of England.

* I may mention in particular, the beautiful sloping woods about Swainston, and various flat, wet coppices in the parish of Freshwater, some of which are full of red currant plants, for the most part small, single shrubs, a foot or two in height, occasionally branched, and even somewhat bushy, but of a lax, straggling habit, quite different from the garden red currant.

† Till a greater number of our botanists devote some share of attention to this most important and interesting department of their science, it is in vain to expect any agreement amongst them as to what plants are or are not indigenous to our island. At present we seem to do little but copy the opinions of others without much inquiry, or pin our belief on some antiquated, obscure, or distorted passage of classical authority. The traditional reasons which have been advanced for rejecting the cherry, the beech and the hop from the catalogue of our aborigines, are known to most readers. An excellent practical botanist gravely told me he thought it probable the holly was originally introduced into this country from Japan! Loudon (*Arbor. Brit.*) thought the elder not indigenous, and the *Arbutus* of the west of Ireland *must* have been planted, in the opinion of some, by the good monks of Mucruss, though it is evident, from certain species that accompany it thither, that its occurrence is owing to a natural extension in a north-westerly direction, of a part of the Spanish and Portuguese Floras to the mild and equable shores of that island. Even the humble violet of our woods and groves has been robbed of the rights of a true born Briton, and boldly declared an alien in a catalogue lately published by botanists of undoubted ability.

I have long remarked that in every individual specimen of the wild currant seen in flower, the blossoms were invariably more or less streaked, dotted or suffused with a purplish brown or russet red colour, and remarkably so on the perigynous glandular disk of the calyx, from which that tinge is never entirely absent, whereas in the garden red currant the flowers are of an uniform pale green, without any such mixture of red. Some other differences between them will be noticed presently. Our Vectian, and I think also the Sussex plant, is, in fact, the *R. rubrum*, β . *sylvestre* of Mertens and Koch,* whilst the figure in 'English Botany' represents that form which we find in cultivation, but which I have never seen wild, or even naturalized here. I am far from believing that the two are anything more than varieties of the same species, and that but slight ones; nevertheless, where a marked difference is uniformly stamped on the aspect of the one which is not found to be possessed by the other, good grounds are afforded for supposing them to be derived, in distinct collateral lines, from some common but remote ancestor.

I shall now proceed to state the differences observable betwixt the wild, or as it may be called, the primary† form of *R. rubrum*, and the state of the species as exhibited in cultivation, or the garden form of the plant, premising that I do not wish to lay much stress upon characters taken from cultivated examples of a species, although, as the same characters, with some trifling variations have been remarked by many and distantly situated observers, it is fair to assume the existence of two tolerably definite races; one, of a type unknown in cultivation, and hence aboriginal with us, which is the point sought to be established.

1. *Ribes rubrum*, α . *sylvestre*, Lam.

Mertens and Koch in Röhling's Deutchl. Fl. ii. p. 249. Koch, Syn. 1st edit. p. 265. Wimmer and Grab. Fl. Siles. i. p. 209. Reichenb. Fl. Excurs. Germ. ii. p. 562. Peterman, Fl. Lips. Excurs. p. 197. Fl. Dan. t. 957. Merr. Pin. p. 104? Dill. in Ray Syn. ii. p. 456?

Smaller in its leaves and flowers than the next form; stamens extremely short, erect, filaments shorter than the breadth of the anther, whose lobes do not rise above the very broad connectivum, and with the filaments resemble in shape the head or handle of a crutch. Calycine disk and other parts of the flower tinged with brown or purple; young leaves much more downy, grayer, and not at all shining beneath. Fruit small, palish red.

* Deutchland's Flora (Röhling's), vol. ii. p. 249.

† Peterman, Fl. Lips. Excurs. p. 197.

In moist, low and boggy thickets, and in elevated woods, banks of streams, &c., in various parts of the south of England, certainly indigenous in Sussex and Hants. Probably the only wild variety in the south of Britain.

2. *Ribes rubrum*, *β. sativum*, Rchb.

E. B. t. 1289 (very good figure from a wild specimen). See authors quoted above.

Larger than the last in its leaves and flowers, the latter especially, which are concolorous, deeper green? (in cult.). Stamens a little connivent, their filaments about equal in length to the breadth of the anthers, the lobes of which are approximate in consequence of the shortness of the connectivum, above the apex of which they rise. Young leaves less downy, greener, and somewhat shining underneath. Fruit deep red? larger than in *α*.

Mountainous woods, moist, bushy places, and banks of rivers and streams in the north of England and Scotland. Everywhere in gardens cultivated for its fruit.

Other differences are noted by authors betwixt these two varieties, but they do not appear to be constant (See Wimmer and Grab. Fl. Sil.), such as the smaller size of the petals in *α*., with a degree of hairiness on the racemes, well marked in some of my specimens which are quite villous in this part. The dark colour of the disk, and above all, the extreme shortness and peculiar form of the stamens, appear the most permanent marks of distinction. The narrow anthers and elongated filaments are clearly expressed in the E. B. figure of *β*. I have little doubt that our wild southern variety is identical with the "*R. fructu parvo*" of Merrett and Ray's Synopsis, found at Wimbledon and in Lancashire.

These two forms of the red currant are widely dispersed over the greater part of central and northern Europe, and in America, ranging beyond the arctic circle in both hemispheres. The Swedish and Lapland plant would seem to belong to our first variety.

The flowering time of our wild currant seems to precede that of the garden type, contrary to what we should expect, since the former was, for the most part, in full bloom in its cool, damp, native situations for some days previous to the date of these remarks (April 11th), whilst the flowers of the latter are as yet but very partially expanded in gardens open to the sun. This may, in some measure, account for the discrepancy in time assigned by different authors to the blowing of the red currant, some giving April, others May, as the blossoming season. In this island all the British species are out of

bloom in May in ordinary years, excepting *R. nigrum*, which extends a little into that month.*

In conclusion, I may state that I regard both *R. nigrum* and *R. grossularia* as being genuine natives of the Isle of Wight. The former, though rare, is found in several of our deep, boggy woods, which produce some other northern species abundantly, as *Epilobium angustifolium* (the long-podded, crisped-leaved form, with small, deep-coloured flowers, a common Hampshire and Sussex plant), *Rubus Idæus* (raspberry), *Viola palustris*, *Myrica Gale*, *Equisetum sylvaticum*, &c., and in rotten, swampy thickets, where the soil and atmosphere are still more cold and humid than that in which the red currant delights; whilst *R. grossularia* occurs frequently but sporadically everywhere, both in the open and woodland, high and low districts, in the clefts of rocky dells and the deepest recesses of our remaining ancient forest ground.

WM. ARNOLD BROMFIELD.

Ryde, Isle of Wight, April, 1846.

Notice of 'The Vegetable Kingdom; or the Structure, Classification, and uses of Plants, illustrated upon the Natural System.' By JOHN LINDLEY, PH. D., &c. *With upwards of five hundred illustrations.*

Of this most voluminous volume it has been remarked by a cotemporary of high authority, "it is not too much to say that none more important to the student of Botany has ever appeared, for to the pro-

* The flowering season of plants, as given in our ordinary and popular Floras, requires careful revision, being lamentably incorrect in numberless instances. The periods assigned are for the most part too limited or contracted, as an example of which I shall adduce *Pulmonaria angustifolia*, which is said to flower in May and June. Now on the cold, stiff clay about Ryde, where the species abounds, it is always in flower by the middle of March, and sometimes at the close of February; it is in highest perfection of bloom by the middle of April; in May half the plants are out of blow, and any one who should visit its localities in June, with a view of obtaining good flowering specimens, would experience some difficulty in finding one in the condition required. So again, *Cyperus longus* flowers in August and September, or even till later, not in July, as the books inform us. The continental writers are more exact than ourselves in this point, so important to the young or inexperienced collector, who is always prone to go by the letter, and to suppose naturally that when June is given as the flowering season for a species it would be in vain to seek it in May or July. Mr. Babington, in his excellent Manual, has done much towards correcting these inaccuracies of his predecessors.

ficient in that branch of study, it contains an immense mass of useful information." Eulogistic as is this opinion, it is yet scarcely more than a *just* tribute to the value of the work, or to the acquirements and researches of the author. There is no volume in the English language, relating to any department of Botany, which can be set on a level with 'The Vegetable Kingdom;' the vast amount of solid information comprised in the volume, and (considering the quantity) the prevailing accuracy and completeness of the details, are quite unrivalled. It recalls to mind at once the more remarkable qualities which separately characterize the works of a Loudon and a Brown. There are here the comprehensiveness and condensation of detail which give value to some of Loudon's large compilations, united with the philosophical spirit of combination resulting from accurate analysis, and the suggestive originality of a Robert Brown.

In thus warmly expressing a sense of the value of the work before us, we refer to its general character as a whole, and with an eye to the intellectual exertion necessarily implied in its production. Doubtless there is much within the 970 closely printed pages, to which plausible and reasonable objections might be set forth. And in so great an undertaking small errors and deficiencies are unavoidable. But it would be a paltry spirit of injustice or jealousy that could urge any one to pick and cull out little things of this kind, which are so completely overshadowed and lost in the practical utility and sterling value of such a work, executed so well. We have tested the volume, here and there, by looking for matters, such as recently published genera, &c., which appeared likely to have escaped the glance of any hurried searcher or careless compiler, and we have mostly found them *not* overlooked by the author of 'The Vegetable Kingdom.' As an inference, fairly drawn from the test, we seem entitled to pronounce the work highly complete and accurate.

The numerous, and generally well-drawn cuts, the many remarks on structure and affinities, with the valuable notices concerning the economical and medicinal uses of the plants, add greatly to the attractiveness of the volume, rendering it altogether the kind of book for a botanist to keep within easy reach of his hands, that it may be taken up and opened, whether for instruction or amusement, at intervals of waiting or unoccupied time; and this over and above its indispensable presence as a dictionary of reference and consultation. Looking to the quantity and quality of its contents, the volume is remarkably cheap in price.

Among the most debateable portions of the plan and contents, may

be mentioned the sometimes rather peculiar grouping of the orders into alliances, and the choice or formation of English names for the orders. And not a small practical objection might be raised against the author's wide changes in the series, or relative position of the orders and alliances.

As an example of the peculiar grouping into alliances, we may cite the disseverance of *Fumariaceæ* and *Papaveraceæ* into different alliances; the former being combined with *Vitaceæ*, &c. and the latter with *Ranunculaceæ*, &c. The union of *Silenaceæ* and *Polygonaceæ* under the same single alliance, seems equally forced at first view; though it may be that familiarity will gradually reconcile botanists to these seeming incongruities, after a little restiveness at first. On placing *Polygonum Convolvulus* by the side of *Silene acaulis*, for instance, it appears more easy to find distinctions than affinities; but the outrageous non-resemblance is a good deal softened down, when *Polygonum aviculare* stands by *Arenaria rubra*; and closer resemblances might be found in other plants less familiar to British botanists.

On the whole, one of our greatest objections to be urged against Dr. Lindley's systematic methods, is that relating to the changed series or relative positions of the orders. It is on the ground of practical inconvenience, however, more than upon scientific views or supposed affinities, that such changes are objected to. Herbaria arranged in accordance with the ordinal and generic series of one author, are not much better than a chaotic medley when they require to be referred to or consulted in connexion with the writings of other systematists. And with the works of Dr. Lindley before us, we need not advert to the varied arrangements of different authors merely, but even to the varying arrangements of different editions from the pen of the same author.

With the complete 'Vegetable Kingdom' at hand, there would be found considerable advantage in the arrangement of orders and genera in correspondence with the series and lists set forth in that volume. But, on the other side, such an arrangement would render a working herbarium highly inconvenient with reference to the *Prodromus* of De Candolle, or to the *Repertorium* of Walpers; to which, as works on species, there is a great practical convenience in adapting the sequence of orders and genera in herbaria.

This ever-recurring *dis*-correspondence between the arrangements of different authors, and of the same authors at different dates, implies some radical fault of method. No doubt it may be partly attributed

to a progressive advance in knowledge of Nature, and to the consequent change or expansion of mental ideas. But more than this single circumstance must be called in, to account for the very remarkable changes in the grouping and relative position of orders, by the same botanist, after short intervals of time. It is believed that the following passage from the pen of another systematist, points pretty clearly to the true reason of such discrepancies :—

“In a work on Astronomy, if the theory be not Newtonian it is nothing; but when a systematic work on Zoology makes its appearance, we immediately inquire ‘what is the arrangement?’ We compare its merits with those of other arrangements, and so unusual a thing is it for an author to adopt the theory proposed by a prior author, that such a proceeding would be held a matter of literary piracy: and should both authors have their works in the same market, this pirating an arrangement would be considered ample ground for an action at law. Thus it appears we all tacitly acknowledge that arrangement, so far as yet carried, is the result of human wisdom, judgment and inventive faculty, and neither has, nor is supposed to have, any reference to the designs of an omnipotent Creator. Those, therefore, who have looked on me with perhaps rather a jealous eye, as a competitor for reputation in the same field—the just classification of natural objects—have given themselves needless anxiety from a mistaken idea of my views: our objects are not the same; our labours do not and cannot clash: *their* desire is, by the application of human knowledge, and human skill, and human industry to build up a system that shall be permanent; *mine* to discover one already built,—a system in which human knowledge, skill and industry have had no part,—a system, in fine, whose Founder and Builder is the Almighty.”—(Newman’s ‘System of Nature,’ pp. 1, 2).

The fact seems to be, that the method of Dr. Lindley is also to “build up a system,” and not “to discover one already built.” But as he proceeds upon a large amount of acquired knowledge, which is considered, compared and arranged by a mind of superior order, the author of ‘The Vegetable Kingdom’ does put forth a system with a very natural look about great part of it: that is to say, plants are well brought into proximity, according to their degrees of resemblance in the main. Still, there are too many things, even here, which appear to have been bundled together simply because the author knew not what else to do with them; their natural repulsion, by points of dissimilarity, being only overcome in a book through the pressure from without—the external force of the master’s “*sic jubeo*.”

As an individual opinion, however, we hold that there is no system of Nature at all, in the sense of separate and distinct groups, whether they are to be called alliances, or orders, or genera. We conceive it quite as natural to classify temperatures into tens, twenties, thirties, &c., or into temperatures melting ice, temperatures melting wax, temperatures melting metals, &c., as to classify the objects of organic Nature into orders and genera. The gradations of structure slide into each other; and draw the lines of separation where we will, the objects on the two sides of the same dividing line, will be more alike than are the objects on the contrary margins of the space between two lines. It matters not whether we take a linear series, or circles, or rays from a centre; wherever we throw many objects into groups, we cut through links of connexion, by which some of them are intimately connected with others to be left out of their own group. To revert to our former example of the *Fumariaceæ*, we find *Hypecoum* placed in the *Berberal* alliance, and *Chelidonium* placed in the *Ranal* alliance; yet surely no botanist could hesitate to say that *Hypecoum* is much more like unto a *Chelidonium* than unto a *Vitis* or *Berberis*!

We alluded also to another debateable matter in the Englished names of orders. An authority before referred to, objects very decidedly to this part of 'The Vegetable Kingdom,' pronouncing the terms *Orchids*, *Hippurids*, *Typhads* and *Aræds* "intolerable" to his ears, and conceiving that "no educated person will prefer the use of these terms." Some of the terms are rather harsh-sounding, it must be allowed; yet to our ears there is nothing intolerable in them, and some of them even sound better than the Latinized terms themselves; more particularly so when used in the singular number. An *Orchid* sounds equally well, and is more conveniently uttered than an *Orchidacea*; a *Cucurbit* sounds quite as euphoniously as a *Cucurbitacea*. The reviewer appeals to educated persons. We believe the appeal ought to be to those educated persons who are not familiar with Latin; for there is a prejudice of education, which may reconcile us to sounds that in themselves are less euphonious, though more familiar. We will acknowledge ourselves wrong, when the ears of educated ladies, little used to the Latinized terminations, have decided against Dr. Lindley's innovations. In short, we prefer most of them, for writing or speaking, in the English language. Our own objection lies rather against the partiality of their use. Though *Celastrads* cannot be called one of the sweet sounds, it should be preferred before *Spindle-trees*, which is substituting a generic in place of an ordinal name, and thus confusing grades of classification. Or, should *Celastrads* be

deemed too "intolerable," why not say *Spindleworts*, on the same principle implied in translating *Aquifoliaceæ* into *Hollyworts*?

Under each order the author gives a list of its genera, with synonyms, and an estimate of the number of its species. Adding thereto the alliances and orders, we get the following general summary of 'The Vegetable Kingdom':—

<i>a. Flowerless Plants.</i>	Alliances.	Orders.	Genera.	Species.
1. THALLOGENS	3	14	939	8394
2. ACROGENS	3	11	310	4086
<i>b. Flowering Plants.</i>				
3. RHIZOGENS	?	3	21	53
4. ENDOGENS	11	38	1420	13684
5. DICTYOGENS	?	6	17	268
6. GYMNOGENS	?	4	37	210
7. EXOGENS	39	237	18062	55911
<hr/>				
Total	56	303	20806	82606

In Steudel's 'Nomenclator Botanicus,' edition of 1841, we had 6722 genera and 78005 species, exclusive of the "Flowerless Plants," so that Dr. Lindley reduces the species, but greatly increases the genera, unless some misprint occurs which we have not yet detected. Should the number of genera in Exogens be 8062 instead of 18062?

C.

Notice of the 'Annals and Magazine of Natural History, No. 112, dated April, 1846.

CONTENTS: "Observations on the tribe Sphæriaceæ, and descriptions of certain new genera," by Prof. Giuseppe de Notaris (translated from the Italian, and communicated by the Rev. M. J. Berkeley). "A Synopsis of the British Rubi," by Charles C. Babington. "On the Development of Chara," by C. Muller (translated from the *Botanische Zeitung* for June 12 and 19, 1845). "On the occurrence of Tetraspores in Algæ," by G. H. K. Thwaites. "Botanical Notices from Spain," by Moritz Willkomm (translated from the *Botanische Zeitung*, November 21, 1845: a continuation of the former papers on the same subject).

This is an unusually full number in its botanical department; the more important papers, as will be seen, being borrowed from the content. Mr. Babington brings down his descriptions of Rubi to a

twenty-first species, with numerous varieties. When the whole have been described we may take the liberty of copying out a list of the names; but doubtless, the descriptions will be published again, as the 'Transactions of the Botanical Society of Edinburgh,' and be thus brought more conveniently within the reach of British botanists. Whatever differences of opinion may be entertained respecting the limits of species, there can be no such diversity of view respecting the value of accurate descriptions and synonyms of the various forms in this ever-varying mass of species, subspecies, varieties, variations and "states," and there is no other British botanist so well fitted for efficiently accomplishing this task, as the individual into whose hands it has now been taken. The descriptions are very long, averaging upwards of a page to a species.

The following passage, from the paper of Mr. Thwaites, has an interest, at least, for Algologists: "On examining, a few days ago, some spores of *Mesocarpus scalaris*, *Hassall*, I thought I could detect in them indications of a quaternary division, and I sent specimens to Mr. Berkeley for his inspection, who wrote me in reply, that he could see the division into four pretty distinctly. I have since observed the same peculiarity in the spores of *Tyndaridea insignis*, *Hass.*, and *Staurocarpus gracilis*, *Hass.*, and, as Mr. Berkeley remarks to me, it may prove more general than has hitherto been supposed. The separation of the contents of the sporangium into four portions, does not take place in our three species until the fruit is nearly mature, and this soon afterwards becomes too opaque for the character to be seen, so that it can be observed only in a particular state of the plant. The sporangium in all the species I have mentioned is more or less compressed vertically."

C.

Correction of an inaccuracy in a Character assigned to the Primula elatior of Jacquin. By HEWETT C. WATSON, Esq.

A NOTABLE inaccuracy of expression occurs in the first volume of the 'Phytologist,' page 1002, fourth line from the top, which must have puzzled any looker into Nature, who sought the peculiarity in the corolla, by which the *Primula elatior* was there stated to be distinguishable from the *P. vulgaris* and *veris*, and their varieties. The passage runs thus: "In the cowslip and primrose, and all their varie-

ties, a circle of scale-like glands [*read* folds] surrounds the orifice of the tube of the corolla. These glands [*read* folds] are absent from the *Primula elatior*." How the printed word came to be substituted for the one which ought to have occupied its place, I cannot now divine; but probably the note was copied for the press, and the wrong word written by mistake at the time of doing this. If a primrose flower be torn into two halves, it will be seen that the corolla has a thickening or puffiness just at the angle where the horizontal limb passes to the vertical tube; the inner surface of the corolla slightly contracting the orifice of the tube. When looked at from above, in the entire corolla, these prominences appear like imperfect scales, which would make a valve to close the tube if more elongated. The like peculiarity occurs both in the cowslip and primrose, although more obvious in the pin-eyed forms of the primrose. In the *Primula elatior* the limb passes more gradually into the tube, which is widest at the orifice. On looking at numerous examples of the three species, and the undistinguishable varieties of *veris* and *vulgaris*, I find that in some of them this character becomes comparatively inconspicuous, although clear enough in the majority. I presume that the five segments of circles round the tube of *P. vulgaris*, in 'English Botany,' are designed to represent this peculiarity. In the figure of *P. veris*, they are (correctly) made bifid or emarginate, and thus appear as ten instead of five. In the figure of *P. elatior*, it will be seen, they are not introduced.

HEWETT C. WATSON.

Thames Ditton, April 18, 1846.

Experiments on preserving Potatoes, conducted in the Glasnevin Botanic Garden, with Remarks on Parasitical Fungi in general. By DAVID MOORE, Esq.*

IN bringing forward this subject, so fully discussed already by men eminent for their scientific and practical acquirements, it is not to be expected that much additional information can now be afforded. But when its national importance is considered, with the large share of public attention which it continues to engross, and particularly as we have now arrived at that period when the effects produced on the

* Read at the evening Meeting of the Royal Dublin Society on the 14th of April.

potato crop of last year are fully known, and forebodings of the worst description rife, relative to the fate of the crop of the present season, I trust I need make no further apology for detailing the results of a series of experiments, conducted in the Botanic Garden during the past winter.

1st. On preserving potatoes.

2nd. On the prospect of potatoes partially diseased being fit to use for seed ; and,

3rd. Whether the fungus which has appeared so uniformly on diseased potatoes is capable of extending itself to sound tubers when brought into contact with it.

The experiments were commenced on the 29th of October last, and continued to the 1st of the present month, when the results which I now purpose detailing were observed to have taken place.

With a view of ascertaining what effect the drying process would produce, we selected four tubers partially diseased, and one sound, which were steeped an hour in water mixed with fresh lime, and then put into a large flower-pot, on the cool end of the flue of a stove, where the temperature ranged between 55° and 56° of Fahrenheit. The diseased tubers soon collapsed, and produced fungi in the course of three weeks, after which they continued to dry up into a hardened mass. The sound tuber remained quite fresh, and was not infected with the fungus, although the others were placed over and under it.

An equal number of tubers, in the same state, were subjected to similar treatment, after being dusted with fresh lime, which appeared to produce no different effect. The diseased potatoes shrivelled up, and decayed quite as soon as those which were neither steeped nor dusted.

In these experiments, I would beg to observe, that the tubers were exposed to the light, and not covered with any kind of mould ; but duplicates of the several lots were treated in a similar manner, when covered with earth, which had only the effect of keeping them longer from shrivelling. The diseased tubers decayed, and left the sound ones without being infected as before.

A large garden potful, about one half sound and the other half diseased, as they were dug out of the earth, afforded similar results.

We next tried them on the shelves of a seed-room, where they were circumstanced in some degree similar to being placed on lofts. Four diseased and two sound tubers were put together, after being steeped an hour in lime and water ; two of the diseased dried up into a hardened mass, two partially so, but were putting out strong buds. Those

originally sound remained quite perfect. The same number unsteeped were similarly treated, but the diseased were not pushing forth buds when examined. Along with these were duplicates covered with mould, which merely had the effect of keeping the potatoes longer fresh.

We next tried packing in the following drying materials, namely, powdered charcoal, turf-mould, and dry sand. Six tubers, placed in charcoal, two sound, two slightly diseased, and two considerably diseased; and after remaining five months covered up they appeared as follows: those much diseased, quite decayed; those slightly diseased, apparently as sound as when put in, and pushing forth strong shoots; the sound still remained so, but had not pushed their buds so forward as the others. The duplicates placed in sand and turf-mould exhibited similar results.

In a damp cellar, six potatoes, all diseased, were placed in dry sand, after being steeped an hour in lime and water, out of which four remain nearly as they were when put up; two have decayed into a putrid mass. Out of a large potful, half sound, half diseased, as they were dug from the field, and placed in dry sand without steeping, a few have decayed into soft putrescence, without producing any bad effects on those which were sound, which remain strong and healthy. I did not find that charcoal or bog-mould preserved them better than sand; in each parcel, those that were much diseased when put up had decayed.

The next experiment I consider to be fraught with considerable interest. It was first suggested, I believe, by Mr. Leland Crosswairhe, one of the members of the Botanical Committee—to ascertain the effect of cutting off the diseased parts before storing. The tubers operated on were those of the apple variety, and out of twenty which were considerably diseased, only two have decayed. Ten were put up in dry sand and ten in turf-mould, after being steeped an hour in lime and water. The two which decayed were covered with sand. Those in the turf-mould continued sound.

The last experiment in preserving, was to leave every alternate drill undug in the open ground, after putting a sufficient quantity of mould over them to preserve them from frost; and the results, in this instance, have been very remarkable. The tubers, both sound and diseased, remain, to all appearance, precisely as they were last October. The decay does not appear to have progressed, even in the partially diseased tubers; the only change which has taken place is in the cuticle, which has become cracked, and presents fissures similar to

those which occur in some sorts of apples. Several of them were pushing forth strong buds when examined.

The probability of the crop of the present season being infected by planting partially diseased seed has now become the most important inquiry; and with a view of obtaining some information on this point, a quantity of apple potatoes were selected, and divided into three classes — those that were apparently sound, a second portion slightly diseased, and a third more so. Of the first class, four tubers were planted, one of them divided into two halves, which have produced apparently healthy plants. An equal number of the second class produced three plants, two of which became sickly, when about eight inches over the surface, and were evidently decaying. On examining the lower portion of the stems, they were found to be getting into a putrid state, close to the old tubers, but no fungi had appeared on the backs of the leaves; the third plant remains apparently healthy, but weak. None of the third class produced plants; but, on examining the mould, a few small, misshapen young tubers were found to have been produced by one of the sets. I ought to state that the whole were steeped an hour in lime and water before being planted. Duplicates were planted without being steeped, which gave nearly similar results. I have, however, observed, within the last week, that the leaves of one of the plants raised from a diseased tuber, has become infected with the fungus, *Botrytis infestans*, the same species which was so general on the leaves of diseased potatoes last season.

Cup potatoes were classed in the same manner, and two tubers of each planted. The sound tubers have produced sound plants; those partially diseased produced plants very weak, and out of the two that were most diseased, one produced a plant, the lower leaves of which have been affected with the fungus, and it is otherwise very weakly.

Two tubers, partially diseased, of the pink-eye variety, were planted, after dividing one of them separating the rose from the root end, which produced two plants, one from the whole tuber, and one from the rose end of the cut tuber: they are both strong and coming into bloom. A few of the tips of the lower leaves of one of the plants have shrivelled, on which the *Botrytis* has been observed.

The last experiment was made on three diseased tubers — one of each of the varieties of the potato I have already noticed. They were cut in halves and allowed to dry on the flue, until the cuts were healed over before being planted, but none of them have produced plants.

To ascertain whether the fungus, which has prevailed so generally on rotting potatoes, infected sound tubers when a few only were put

together, large pots were filled with potatoes, some sound and others in various stages of disease. The pots were placed together in dry and moist situations, when the diseased tubers soon decayed into a soft putrid state, without, in any instance, infecting those that were sound, although in close contact with them.

Such were the experiments I considered advisable to conduct, with their results; and, although made on a small scale, the inferences deducible from them are not devoid of interest to the practical agriculturist.

In the first place, it appears that diseased tubers, exposed to a dry, warm atmosphere, decayed much quicker than those subjected to any of the other modes of treatment.

Secondly, that diseased tubers placed on shelves in a cool room, but exposed to atmospheric changes, decayed sooner than their duplicates which were in the same house, but covered with mould.

Thirdly, that diseased tubers placed in a dry cellar, where the temperature was low and uniform, kept much better than those which were in drier media.

Fourthly, that where the affected parts were cut off diseased tubers, and then steeped in lime and water, they have not decayed nearly so much as when left whole.

Fifthly, that potatoes left in the ground have not decayed further than they were last November.

Sixthly, that sound potatoes have kept as well as in ordinary seasons.

In reference to plants produced from different states of the tubers—

1. Those that were much diseased decay quickly when placed under the influence of heat and moisture, and do not produce plants.

2. Those slightly diseased are liable to fail, and the plants produced are weaker than those from healthy tubers; and, further, that they are liable to become affected on the lower portion of the stem, and decay.

3. Sound tubers produce, apparently, sound plants.

4. Cup potatoes, though slightly diseased, are not so liable to fail as some others in the same state, though the produce of such is not so healthy nor strong as those of sound tubers.

5. Steeping in lime and water appears to have had very little effect.

Now I am inclined to infer from these facts, that the decay which has taken place among stored potatoes, has not been caused by the disease progressing, but rather from the effect it produced last autumn, and the manner in which they have been stored. It is well

known, that large quantities of potatoes, heaped together, always produce a slight heat which, as a matter of course, would be increased by the decaying material of the diseased tubers, to a degree, it is reasonable to suppose, that would prove injurious to the whole heap, especially if many of them were effected. Indeed, one instance is recorded by Professor Henslow of spontaneous combustion being nearly generated by a heap of decaying potatoes. When the heaps have been attended to, and occasionally turned over, having the diseased tubers picked out, I believe they have kept as well as they usually do, without further trouble.

It is apparent that much of the success of this year's crop depends on selecting sound seed; for, although diseased tubers vegetate and produce plants, they are mostly weak, and certainly liable to decay; and very many of them will fail if used, because it is to be observed, that the conditions necessary for active vegetation are, precisely, those conducive to putrefaction, which may become too powerful for the vital force to resist, before the young shoot has increased sufficiently to be independent of the old tuber for support.

With reference to the decay which has already manifested itself this season, I am not prepared to offer a decided opinion as to whether it is the result of last year's disease, or a modification of it: but in most of the cases which came under my observation, from plants raised in the Garden, as well as those sent to me from the country, the decay is clearly traceable to the old tuber. It takes place on the lower portion of the stem, generally close to the tuber. In some of the worst cases I could not observe that the *Botrytis* had been produced on the leaves, but in two instances it was very evident, and agreed, in every way, with the specimens collected last season by the Rev. Mr. Berkeley, and kindly communicated to me. In such cases, however, had sound seed been used, it is probable that we should have had no appearance of disease.

This leads me to offer a few remarks on parasitical fungi which are destructive to agricultural plants. Those who have attended to the subject must be aware that some of the most distinguished investigators of the cause of the potato-disease, consider this minute mould, *Botrytis infestans*, to have been the immediate cause of the murrain of last year, and, no doubt, it has very generally accompanied it both in this country and on the continent. Its appearance on diseased plants this season, is, therefore, the more remarkable. I can, however, state with confidence, that two of the plants on which I have observed it, were diseased long prior to the appearance of the fungi on the

leaves; consequently, if the mould were the *cause*, the spawn producing it must have affected the plant at a very early stage of its growth, and proceeded from the root in place of the stem.

The Rev. Mr. Berkeley has accompanied his interesting memoir on the potato-murrain with a beautiful series of microscopical drawings, showing how this mucedinous plant grows, extending its filamentous spawn under the cuticle of the leaf, and shooting up singly, or in fascicles, through the apertures of the stomates, thereby obstructing the admission of air, and the emission of perspiration, besides preventing the plants from elaborating nutritive sap in the leaves.

Although I still consider the mould only an accompaniment of the disease, I am well aware of the vast devastation such minute plants are capable of producing on the tissue of the larger vegetables. The ravages of mildew, smut and bunt, are well known, and afford familiar instances. The dry-rot—which was formerly such a dreadful pest in rotting the timbers of ships and buildings, caused by the growth of *Merulius lachrymans*—is another, but happily it has been, to some extent, subdued since the process of steeping timber in certain saline and acid mixtures became general.

These parasites, further, are particular in selecting the victims for their attacks, and confine themselves, in most instances, either to a single species, or to those of a genus; but occasionally, the same species of parasite is found to grow on many of the plants belonging to one natural family, and the conditions necessary for their development are so peculiar as to preclude the possibility of effectually guarding against them. The spores or seeds are so numerous, that if those produced from a single head of diseased grain were all to vegetate, they would be sufficient to infect a whole district; and I believe there are few fields of wheat ever found effectually free from them; but as these minute spores depend so entirely on peculiar atmospheric conditions for development, it is probable that one out of every million will not vegetate the same season in which they are produced, though, like the seeds of some of the larger vegetables, they may, if favourably circumstanced, remain dormant for a great length of time, until the conditions essential to their development do occur, when they will appear in extraordinary quantities, as we occasionally find to be the case. It is not well known how the spores gain admission to the vegetable tissue, but Dr. Greville, of Edinburgh, whose knowledge of the fungi is so accurate and extensive, has lately expressed an opinion, that they may at all times inhabit the tissue of those species of plants to which they are respectively peculiar, without, under ordi-

nary circumstances, deranging the vegetable functions, in the same manner as minute parasites infest different parts of the animal structure. A good opportunity occurred casually in the Botanic Garden of affording data to judge of the fearful consequences of the corn fungi when no means are used to check them. In cultivating small samples of as many of the different kinds of the cereal grains as we could procure, constantly on the same piece of ground, without change of seed, the samples which were originally clean soon became infected, which increased every subsequent year, until at length the varieties which had been longest cultivated became so completely covered with mildew and smut, that out of the produce of three square yards or so, we could get scarcely a single head free from the fungi. In this instance there is reason to suppose that the spores were propagated by inoculation on the seed, and also that they were imbibed through the cellular tissue of the rootlets, along with the water containing the nutritive matters afforded by the soil.

Many more interesting cases might be brought forward to show the extensive operations which these minute plants perform in the vegetable economy, which I cannot follow further at present. In the foregoing observations I have endeavoured to treat the subject in rather a popular manner, avoiding such scientific details as would necessarily be tedious, if not uninteresting, to those who have not hitherto turned their attention to such investigations. I believe the only cure yet known for smut and mildew, is steeping the seed, if grain, in chemical solutions calculated to destroy the vegetative principle of the spores of the fungi, with a proper rotation of cropping. My object in noticing the matter in connexion with the foregoing part of this paper, has been with a view of directing the attention of practical gentlemen to its importance. The fungi which have so uniformly accompanied the potato-disease, prove that they have some connexion with it, as I do not think I have seen a single tuber on which the decay had progressed to any considerable extent, but what became more or less covered with the *Psilonia rosea* of Berkeley. At a late meeting of the Highland and Agricultural Society of Scotland, a paper was read on this subject by Mr. Goodsir, when a practical gentleman who was present, stated that he had been for a number of years in the habit of steeping a bole* of wheat in three quarters of a pound of sulphate of copper (or bluestone) dissolved in water, which he had found

* Six bushels.

to be an effectual remedy against the corn fungi. I would beg to suggest to such as are fond of trying experiments, to steep some of the seed-potatoes in such solutions as our chemical friends may recommend, being persuaded the root is the right end to begin at in endeavouring to find a remedy for the evil. I am aware that several persons have already tried this, and I am doing so myself, having steeped some in a solution of salt in water, and am making preparation to try the sulphate of copper steep.

The great importance of raising new seedling varieties of the potato ought to be specially attended to, not that I think seedlings recently raised were less subject to be affected by the disease, but because I feel convinced there yet remains great room for improving this important esculent in form, produce and quality, though it might be supposed, that by general consent, it were agreed that potato culture had reached the acme of perfection, so far as attempts have been made to improve varieties of late years; and in this point of view, the late failure may yet be found to have been the cause of producing important results.

To make the most of sound seed is another consideration which forces itself on our attention at the present time. I believe it has generally occurred that tubers which were much divided at planting, were more liable to decay than those which were planted whole. It might, therefore, be a somewhat hazardous experiment to cut potatoes much while such uncertainty prevails concerning their growth; but from experience I can vouch that young shoots, taken from tubers after they have grown three or four inches, and have their rootlets, will grow and produce excellent crops, if carefully removed from the tuber and planted separately, and in this way sound seed might be amazingly increased, as we annually prove in the Botanic Garden. I do not, however, mean the long, blanched shoots which grow from potatoes crowded in close pits; to be successful, the tubers must be placed in situations where the young shoots will get both light and air, and thereby gain some strength before they are removed from the old tuber. It is also necessary to choose moist, cloudy weather for planting, if possible.

An experiment of this nature is now being tried in the Garden, at the suggestion of his Excellency the Lord Lieutenant. I have been directed by the Council of the Royal Dublin Society to remove the young shoots, produced from diseased tubers, and plant them separately, to prove what effect that will have in staying the decay, the

results of which I shall have the honour of reporting to the Society at a future period.

DAVID MOORE.

April, 1846.

[The foregoing very important paper was illustrated by specimens of potatoes in some of the different stages alluded to by Mr. Moore; and also microscopical drawings of the cellular structure of the potato, and the fungus, *Botrytis infestans*, in different stages of its growth].

BOTANICAL SOCIETY OF LONDON.

April 4, 1846. — Edward Doubleday, Esq., F.L.S., Vice President, in the chair.

Donations to the Library were announced from the Horticultural Society of Berlin and Mr. W. Pamplin.

The following specimens were exhibited:—

1. Dwarf and much branched forms of *Gnaphalium minimum*, sent by the Rev. G. W. Sandys, as bearing the general appearance of *Gnaphalium uliginosum*, and at first sight seemingly distinct from both of these species.

2. Examples of the peculiar *Linaria* from Bandon, in Ireland, labelled with the MS. name "*Linaria sepium*, *Allm.*" For these specimens the Society was indebted to Professor Allman, who, however, did not add any remarks in explanation of the change of name. They are identical with the Cornish *Linaria*, described by Mr. Hewett Watson in the '*London Journal of Botany*' under the name of *Linaria Bauhini*. The specimens are so completely intermediate between *L. vulgaris* and *L. repens*, in their technical characters, as to have led several botanists into an opinion of their hybrid origin; and this view is certainly supported by the fact that Hampshire specimens are again intermediate between *L. repens* and *L. Italica* (*Bauhini* and *sepium*).

3. Continuation of Mr. Andrew's series of Irish Saxifrages to illustrate their wide range of variation; the species exhibited on this occasion being the *S. Geum* and *S. hirsuta*. From the beautiful series of specimens now in the Society's herbarium, the fact of the Hibernian forms *including* those of the Pyrenees, is placed beyond all doubt or cavil, while the specific identity of *S. Geum* and *S. hirsuta*, is rendered probable.

The Herbarium Committee of the Society has just issued the following Address to their Fellow Members.

THE Herbarium Committee appointed by the Botanical Society of London, feel themselves called upon to make one more effort to insure observance of the rules which are indispensably necessary for carrying out the leading object of the Society, — namely, the EXCHANGE OF SPECIMENS. The Committee regret to be under the necessity of stating, that several of the Contributors still habitually disregard the rules laid down for their guidance. The effect of this inattention, is to injure the good name of the Society, and also to cause so much personal trouble and loss of time to the resident Members, as to excite serious apprehension that the Society will be compelled to suspend the exchanges of British specimens, unless the present remonstrance shall prove effectual in inducing a more uniform and systematic attention to their regulations. At the same time, the Committee feel bound to limit this censure, by stating that, in general, the rules are much better observed by those Contributors who are most favourably known as botanists; the defaulters being chiefly among those who are believed to have less acquaintance with botanical science, than many of their fellow Members. This circumstance leads to a presumption, that the faults arise chiefly from inexperience, and may be amended by due attention to rules explicitly stated.

On the part of the Committee, also, increased experience has shown the expediency of some changes in the regulations printed on the cover of the 'London Catalogue of British Plants.' It has, therefore, appeared desirable to reprint the rules, in an amended form, and to send a copy of them to each Member of the Society. It is not compatible with the limits of a circular intended for post, to give reasons for all these rules at length. They are now the result of much experience and careful consideration; and the Committee earnestly request a strict observance of each and all of them. Distant Members, unacquainted with the routine management in London, can form no estimate of the inconvenience which they may occasion by neglecting one or other of these rules: the only safe and proper course, being that of uniformly attending to all of them. Provided the Contributors will do this (their own) duty, no reasonable exertion will be wanting in London towards continuing the efficiency and increasing the usefulness of the Society. The Committee deem themselves entitled to add, and they do so with confidence and gratification, that neither private correspondence, nor membership of any other association, has

ever given British botanists those advantages in forming their herbaria, which are now realized by membership of the BOTANICAL SOCIETY OF LONDON.

Regulations for the exchange of British Specimens. — 1. The Society exchanges specimens with any Member; also with foreign botanists, who are not required to become members.

2. The annual subscription entitles a Member to claim fifty species, without the necessity of contributing specimens in return.—[N.B. In justice to those who do contribute them, the non-contributing members are thus supplied from the surplus specimens, which are not required by Contributors for the same year.]

3. The return made to any Contributor in future, will not bear reference to the number of specimens sent by him; but is to be determined by their *condition and quality*, and by the *exactness of his attention to these regulations*.—[N.B. It has been found that the parcels which include the greatest number of specimens, are often the least valuable to the Society; the numbers being made out by breaking the plants into fragments,—by introducing common species, not likely to be useful to the Members,—or by attempting to dry too many specimens in proportion to the quantity of paper used, and thus spoiling the whole lot. A parcel is set down “GOOD,” when it contains complete and well-dried examples, whether few or many.]

4. Contributors may send parcels at any season convenient to themselves; a return parcel to be made up for each Contributor, as soon as practicable after receipt of one from him.

5. Lists of desiderata may be made by attaching a short horizontal mark before the names of the species and varieties in the ‘London Catalogue;’ the marks being prefixed *only to those which are required by the applicant*. If preferred, a manuscript list may be sent instead, including *both the numbers and the names*, written in the same order or series in which they are printed in the ‘London Catalogue.’

6. Lists of the Society’s desiderata will be supplied to the contributing Members from time to time. And in order to prevent the accumulation of useless specimens, Contributors are requested to send *only the species asked for*; an exception to this rule, however, being made in the case of newly discovered species, or remarkable varieties not included in the ‘London Catalogue.’

7. It is greatly more convenient for the Society to have *few species* and many specimens sent in the same parcel.—[N.B. Fifty specimens of one really scarce species, may often be more useful than five

hundred specimens divided among fifty different species; while the loss of time in sorting and arranging, might be nearly fifty times greater in the latter case.]

8. The specimens are required to be sufficient examples of their species. Small plants should be sent entire, roots inclusive. Long plants should be folded to a convenient size. *No fragments* ought to be sent, unless in the case of trees, or other large and branched plants, which cannot be folded within the proper dimensions.—[N.B. The figures in Newman's 'British Ferns,' second edition, pp. 122, 209, 215, 223, &c., afford examples of folded specimens. In a parcel lately received from the Azores, plants of three and four feet long were sent entire, having been carefully folded before they were dried in Bentall's sixteen-inch drying paper.]

9. Specimens ought never to exceed *fifteen inches* in length when dried. If longer, they must be bent and folded to that length *while fresh*.—[N. B. The Society's duplicate paper is seventeen inches in length,—a size seldom exceeded in herbaria. The specimens should be considerably shorter than the paper in which they are to be kept, in order to lessen the chance of breaking in turning over the duplicate store, while selecting the desiderata of Members.]

10. The specimens should be pressed in porous paper, *sufficient in quantity* to dry them rapidly, and thus to preserve their colour,—being also placed under a pressure *sufficiently heavy* to keep their leaves from becoming wrinkled and brittle. — [N. B. It is quite evident that inexperienced botanists frequently use too slight pressure, and *very* frequently put too many specimens into their drying paper at once. It is better to dry a half or a-quarter the number, and to do it properly.]

11. It is found necessary to require, in future, that all British specimens, sent for exchange, *be labelled by the Contributors themselves*; the labels to be attached to the specimens in such a manner, as to leave the number and the name perfectly clear and uncovered by the specimen. — [N. B. A *single* slit at the base of the label, or in any blank part of it, is a quick and convenient mode of attachment. But the neatest method hitherto in use, is that of placing the specimen wholly behind the label, and attaching it thereto by a small strip of gummed paper; as in many of the Irish specimens from Mr. Andrews, dated in 1845.]

12. The labels are expected to show the following particulars,—at least so far as the Contributor's knowledge can supply them:—

1. The *No.* of the species according to the 'London Catalogue;' if a variety, the *No.* and *letter*. [N. B. The *No.* and *letter* should precede the name of the plant at the upper corner of the labels.]
 2. The name of the species, from the same Catalogue; always with the addition of the *authority* after the specific name.
 3. The name of the *county* in which the specimen was collected; together with any more exact description of the locality, which the Contributor may think fit to give. — [N. B. Different places bear the same name in so many instances, as to create much error and confusion about localities when the *county* is omitted.]
 4. The name of the Contributor; that of the *Collector* also being added, if not the Contributor himself. — [N. B. The best place for the names of Contributor and Collector is at the base of the label — not at the top.]
 5. It will be understood, that the labels are those of the individual Contributor; consequently, the words "BOTANICAL SOCIETY OF LONDON" should not be used on them.
13. Each parcel should enclose a list of the species sent, stating the number of specimens, dated, and signed with the name of the Contributor. — [N. B. It is requested that these lists may be written on pieces of paper, the size of a leaf from an octavo volume, the writing being on one page of each leaf only, with a clear margin opposite the left hand; in order that they may be preserved and bound together, as a registry of the Society's obligations to the individual Contributors.]
14. Any unsuitable specimens will be returned to the member who sends them, in order that he may clearly understand which of his specimens appeared unsuitable for the objects of the Society, and may thus be enabled to avoid repetition of the same mistake.
15. It is requested, lastly, that Contributors will not feel themselves entitled to imitate the defective specimens sent to them from London. It is obvious that the Society can send out only such as are received, and that the Contributors themselves must take the lead in sending better. — [N. B. Though hundreds of specimens are burnt each year, still, in the absence of better examples of their species, many ill-dried, mutilated, and otherwise insufficient specimens are unavoidably sent out. Members may keep these, as temporary substitutes for better, and still mark the species in their lists of desiderata.]

Suggestions to Contributors of Foreign Specimens.—In collecting

and drying the plants of other countries, the preceding regulations may be followed as far as circumstances will admit. But in parcels of foreign plants, it is desirable to include as many different *species* as possible, omitting only the *common* European plants. It is not required that all the specimens should be labelled, though it is wished that each species should have its label. When a foreign parcel includes 500 specimens, or upwards, the Society will print labels for them,—if from the same country and Contributor.

Additions to the London Catalogue of British Plants.—Specimens of the following species have been lately presented to the Society, having been discovered in Britain, or distinguished from allied species, since the publication of the Society's Catalogue, in which they are not included by name.

Helianthemum Breweri, *Planch.* (Phytol. ii. 31). *Spergula stricta*, *Sw.* (Id. ii. 1). *Cerastium strictum*, *Linn.* (Id. ii. 441). *Trifolium Bocconi*, *Sav.* (Id. ii. 237). *Rubus tenuis*, *Salt.* (Id. ii. 192). *Rubus Borreri*, *Salt.* (Id. ii. 192). *Rubus Babingtonii*, *Salt.* (Id. ii. 192). *Oenanthe Lachenalii*, *Gmel.* (Id. ii. 13). *Galium Vaillantii*, *De C.* (Id. ii. 1). *Carduus setosus*, — (Id. ii. 31). *Carlina racemosa*, *Linn.* (Id. ii. 413). *Vaccinium macrocarpum*, *Ait.* (Id. ii. 441). *Orobanche amethystea*, *Thuil.?* (Id. ii. 239). *Teucrium Botrys*, *Linn.* (Id. i. 1086). *Sisyrinchium anceps*, *Lam.* (Id. ii. 500). *Carex montana*, *Linn.* (Id. ii. 289). *Glyceria plicata*, *Fries.* (Id. ii. 444).

Any additional information may be obtained by application to the Secretary, G. E. DENNES, Esq., Botanical Society, 20, Bedford Street, Covent Garden, London.

May 1, 1846. — Edward Doubleday, Esq., V. P., F.L.S., in the chair.

Donations to the library were announced from Mr. A. Henfrey, Mr. A. Gerard and the Horticultural Society of Berlin. European plants had been received from Mr. John Ball and the Rev. Thomas Butler.

Mr. Thomas Bentall exhibited a specimen of *Primula elatior*, in illustration of his note on the plant in 'Phytologist' ii. 515.—G. E. D.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, April 9th, 1846. — Professor Balfour, President, in the chair.

Holmes Ivory, jun., Esq., 9, Ainslie Place, was elected a Resident Fellow, and Frederick Townsend, Esq., Trinity College, Cambridge, a non-resident Fellow of the Society.

Several donations to the library and museum were announced; particularly from Mr. William Gardiner, jun., Dundee, his elegant little work on the Mosses, intended as an introduction to the study of that interesting tribe of plants, and which seems well fitted to accomplish the object in view; also his list of Hepaticæ, and prospectus of the 'Flora of Forfarshire', now preparing for publication by subscription; also proceedings of the Horticultural Society of Liege, from Professor Morran.

The following communications were read:—

1. Botanical Excursions in Upper Styria in 1842. By Dr. R. C. Alexander.

In this paper Dr. A gave an account of various excursions to the mountainous parts of Styria, during which he visited the Schökel, Lantsch, Leoben, Reiting, Yolling, Klagenfurt and Salzbach. He also gave a detail of the various plants observed during his tour; and stated that he had collected in all about 900 species, of which upwards of twenty were new to the Flora of Styria. The paper was accompanied by a list of the principal plants collected south of the Drave. Specimens from the Society's herbarium, contributed by Dr. Alexander, were produced to illustrate the paper, of which an abstract will probably appear in the 'Annals of Natural History' and in the Society's Transactions.

2. 'Remarks on the claims of certain species of plants to be considered indigenous to Britain.' By Mr. R. M. Stark.

At the commencement Mr. S. adverted to the progress of botanical geography, and particularly to the labours of Mr. Hewett C. Watson, in his works on the distribution of the British Flora. Passing over the instances of shrubs and perennial herbaceous plants found apparently wild, but which have undoubtedly escaped from the garden, he directed the attention of the meeting to the large family of annual corn-weeds, and their claims to be regarded as truly indigenous to Britain. Though universally dispersed wherever the plough and the agency of man extended, the fact of their not being found associated with other annuals where the land was waste and uncultivated, seem-

ed to prove that they were the companions of the cereal grains, and with them had been introduced at a very remote period. Some of them (of which several instances were given) are confined to one side of the island, or to certain districts of the country, which showed that, notwithstanding their probable exotic origin, they were more or less subject to the laws regulating the distribution of organic life. He expressed his opinion that it would be desirable, both for the interests of science and agriculture, that these plants and their prevalence or rarity in various districts should be recorded in our catalogues, local Floras, and other works of a similar description.

Mr. James M'Nab exhibited flowering plants of two curious species of *Arum* (*A. cordatum* and *A. cornutum*), raised in the garden of the Horticultural Society, from seeds sent home by William Jameson, Esq., Saharumpore, in April, 1843. The flowering spathe of the one was two feet, and of the other eighteen inches in length, both being beautifully mottled with brown and yellow spots; and, what is very remarkable, the two species were sown on the same day, and after receiving the same treatment for about three years, flowered within twenty-four hours of each other.

Beautiful specimens of *Pinguicula grandiflora*, from Bandon, near Cork, communicated by Miss Carpenter, Bristol; of *Vaccinium macrocarpum*, from near Mold, in Flintshire, by Dr. Bidwell, Albrighton; and of *Dianthus cæsius*, from the debris of Salisbury Crags, by Mr. John Laing, Experimental Garden, were exhibited to the meeting.
—*W. W. E.*

Discovery of Sphærocarpus terrestris in Fruit near Norwich.

By GEORGE FITT, Esq.

I HAVE lately found this plant abundantly in fructification near Yarmouth. Sir W. Hooker mentions in the 2d vol. of the 'British Flora,' that he had never been fortunate enough to meet with it in fruit, and had never seen its ripened capsules,—and he now believes that they have not before been found in England. Mr. Turner, who found it for many years in this neighbourhood, and to whose kindness I am indebted for a knowledge of its habitat, never gathered it in that state. I have met with it only sparingly for three or four years, but it has been very plentiful this season, and I first observed its capsules on some patches which were laid aside in water for a few days, to keep them fresh. Last week I gathered a good number in fruit, in a

clover layer, where I this year find it most plentifully. The author of the 'British Flora' says "much more rarely I have found one of these pistilliform bodies enlarged into a perfectly spherical form, tipped with a short, slender style, the whole not larger than the eighth of a perianth." He here describes, probably, an immature or abortive capsule; for the description answers to those which I have examined, excepting that the latter fill two thirds of a perianth, the lower portion of which is distended by the bulk of the capsule. He says further, "the contents of so small a body I could not satisfactorily ascertain, but they appeared, when pressed out, to consist of a pulpy substance." One fine one, which I broke open, contained 300 seeds, if I may so call them, each much resembling the capsule in their beautiful reticulations. They differ, however, from the latter, in being perfectly transparent, the light reflected from the mirror of the microscope being seen through their reticulations, while the capsule is yellow and opaque. The seeds are surrounded by a fluid substance, which disappears as they ripen, and amongst them are a few, irregular-shaped bodies, or collections of minute cells, of a bright green colour, beautifully contrasting with the pale yellowish hue of the seeds. The capsules are tough and highly elastic, bounding away from the microscope two or three feet when pressed with a needle.

The seeds from one *very ripe* capsule appeared to have an aperture on one side, but I have not been able to detect this appearance in any others; possibly because not sufficiently ripe.

GEORGE FITT.

Yarmouth, Norfolk,
April 21, 1846.

Notes on the Wild and Cultivated examples of Ribes rubrum.

By HEWETT C. WATSON, Esq.

ON reading Dr. Bromfield's remarks upon the wild and garden currants of the Isle of Wight, in last month's 'Phytologist' (ii. 517), I proceeded to ascertain how far those in my own garden would correspond with either of the two varieties mentioned by Dr. Bromfield, the "sylvestre" and "sativum." I found the characters combined differently from their combinations reported by that exact botanist. But as there are several slight varieties of the red currant in cultivation,

it was to be expected that some would approach nearer to wild varieties.

On the 5th of May there were still several fresh-opened flowers, and even some unopened buds, on the bushes in my garden. In those recently expanded, the filament was about equal in length to the breadth of the anther; but in those which were fading, the filament was twice as long. (Such an elongation of the filament is observable in many plants). The lobes of the anthers, out-topping the connectivum, were separated by a space equal to their own breadth, or nearly so; being thus unlike the figure in 'English Botany,' and corresponding well with Dr. Bromfield's apt comparison to the head or "handle of a crutch."

On some bushes the flowers were of one uniform and yellowish green colour; while on others, each lobe of the calyx had a large blotch of brown or dull purple. The leaves of all had the character mentioned by Dr. Bromfield, though not equally so.

Thus, my garden bushes agree with the variety "sativum," in the main; but in the character of the anther, and partially in the colour of the flower, they belong rather to the variety "sylvestre." Moreover, I have several times observed that the leaves of stray seedlings, which spring up about the kitchen garden, and also (bird sown) among the shrubs in the flower-garden, are much more pubescent than those of their presumed parents, the cultivated bushes; nevertheless, some of these young examples have shown their parent foliage. As such stray seedlings usually fall victims to the gardener's destructive labours, I cannot now find one of them sufficiently advanced to produce flowers. But under the facts here stated, the differences observed by Dr. Bromfield do not appear conclusive arguments against the likelihood of the wild bushes in the Isle of Wight being bird-sown descendants of the garden currants. They may have multiplied in their wild state; but this fact, if it be such, will not make them "natives," in case their primary stock was that of the gardens.

Dr. Bromfield's opinion is no slight testimony in favour of the view which makes the currant a true native of Hampshire and Sussex. Still, it appears to myself, that in the absence of certain proof either way, the probability leans against the native claim of the red currant in the midland and southern counties. The propagation of fruit from seeds by the agency of man and birds, is an admitted and familiar fact; and we do not find currant bushes so numerous and general in the southern half of England, as to give this instrumentality the semblance of a cause inadequate to the results observed. I may confidently say

that, since July of last year, hundreds of seedling currants have sprung within the limits of my own gardens; many of them in spots to which they must have been conveyed by birds. I should therefore consider that birds and mankind might unconsciously stock the woods of the Isle of Wight in the space of a few years. The supply of seeds being constantly renewed, the stock would be kept up, under suiting conditions of soil and climate, even supposing the wild (become wild) bushes not to produce others from their own seeds, as would more probably be done under such conditions.

Dr. Bromfield observes that the wild currants flower at an earlier date than those of the garden, in the Isle of Wight. This is something additional to the evidence on the native side; but still far from conclusive. I cannot state anything positive about the currant; but we have an analogous case in the gooseberry. Occasionally the seedlings of the gooseberry have here escaped destruction, and produced flowers and fruit among the ornamental shrubs of the flower-garden. In this shaded situation, the leaf-buds of the gooseberry are at least a fortnight earlier in expanding than are those of their parents cultivated in the open borders of the kitchen-garden. I scarcely know whether to attribute this difference to the variety or to the shade. It is, however, a fact, that the shelter of trees will frequently hasten the leafing and flowering of plants in spring; the ground being much less cooled by radiation during the severe nights of winter and earlier spring, in such situations. At the same season, the surface of damp ground is less cold than that of dry ground, at least, it is so where the dampness is occasioned by water oozing out from underneath the surface. The damp and shaded places in the Isle of Wight, may really be less cold to a plant in early spring; although, as the season progresses, the open borders of a garden may acquire a higher temperature under the sun's rays; the balance left after radiation being then turned in favour of the garden ground.

Among notes of the dates at which garden plants open their first flowers in my own garden (say fifty feet above the sea), near the north base of a ridge of hills, rising from one to two hundred feet higher, I find the following:

Gooseberry, March 20, 1835. March 20, 1836. March 17, 1837
 ("N.B. A seedling bush flowered long since"). April 7, 1838.
 April 7, 1840. March 26, 1842. March 23, 1843. April 1, 1844.
 April 17, 1845.

Red currant, April 11, 1838. April 10, 1840. March 31, 1843.
 April 11, 1844. April 21, 1845.

Black currant, April 16, 1835. April 28, 1838. April 30, 1839.
 April 9, 1841. April 18, 1843. April 27, 1845.

HEWETT C. WATSON.

Thames Ditton,
 May 6, 1846.

Notice of 'Outlines of Structural and Physiological Botany.' By
 ARTHUR HENFREY, F.L.S., &c., Lecturer on Botany at the
 Middlesex Hospital, late Botanist to the Geological Survey of
 the United Kingdom. Part I. Van Voorst, London.

AIDED by the wonderful improvement in microscopes, and the great advances in chemical science which have been made in late years, several eminent physiologists on the continent have laboured to explore the secrets of vegetable nature; but hitherto their publications have been almost inaccessible to many persons in this kingdom, who find it inconvenient to spend much money and time in the perusal of foreign periodicals. Such readers will now find the first part of this admirable little treatise an instructive summary of what has been written on the subject of elementary structures, to be followed up in two succeeding parts by an exposition of the organs of vegetation and those of reproduction and general Physiology. The book is not a mere compilation; but one of a class which in these days is very much wanted, where an accomplished student of Nature, judiciously availing himself of the labours of his predecessors and contemporaries, and submitting them to the test of re-examination, presents them in a concise and lucid form, enriched with original comments of his own. Here, too, the reader will find the various opinions of different writers usefully contrasted. Mr. Henfrey has laudably aimed at the exclusion of groundless hypotheses. The subject, indeed, cannot be profitably discussed without the introduction of theory. An actual knowledge of the process of vegetation is at present beyond our reach; but there are analogies observable in the lowest and simplest plants which tend to show that every individual plant originates in a single cellule. This conclusion can only be met by the difficulty of accounting for the diversity of structure presented by different parts of the tissue in the higher tribes. Physiologists have not been able to ascertain how many cellules exist in the embryo oak while it is yet lodged in the acorn; but it is almost impossible to conceive them to

be equal in number to those of the full-grown tree. If fewer, then the subsequent addition must have been elaborated by the primordial cellules. In the base of a stem of *Botrychium Lunaria* the rudimentary plant which is to expand two years hence, may be found lodged in the heart of another rudimentary plant which takes precedence of it, and waits to succeed the plant of the present season. The formation of buds in exogenous plants may commence at an equally early period: and if so, we may in vain hope to detect their elementary cellule, or to trace the order of development. Mr. Henfrey's useful book does all that can be done to simplify the study of vegetable physiology, and we cordially recommend it on account both of its excellence and its moderate price.

The numerous illustrations, executed by himself, are more truthful than any we have previously seen, and the details of the work are more in accordance with our own views than are given in any other English work. Only one exceptionable statement occurs to us. The commonly entertained opinion that the evolution of carbonic acid by night from the leaves of plants, proceeds from the oxidation of the tissues has, we think, been disproved by Liebig, who shows that it may be nothing more than the escape of what was contained in the water previously absorbed by the plant and passing off by evaporation.

G.

Notice of the 'London Journal of Botany,' No. 53, dated May, 1846.

(Continued from page 508).

THE contents of this number are, "Contributions to a Flora of Brazil," by George Gardner (continued from the April number). "Botanical Information." "Catalogue of the First Series of Plants of Java, collected by Mr. Th. Lobb," by M. J. E. Planchon. "Description d'un genre nouveau, voisin du *Cliftonia*, avec des observations sur les affinités des *Sauraya*, des *Sarracenia*, et du *Stachyurus*," by J. E. Planchon. "New *Hepaticæ*," by Thomas Taylor, M.D.

The descriptions of South American *Compositæ*, necessary as such accounts may be to the technical and systematic botanist, will possess interest for few readers. The "Information" embraces announcements of Zeyher's South African Plants and Bergeau's Canary Plants, now on sale; along with short notices of Plee's "Type de chaque Famille et des principaux Genres des plantes croissant spontanément

en France," of Gardiner's 'Twenty Lessons on British Mosses,' and of Harvey's 'Phycologia Britannica,' The Catalogue of Lobb's Java plants will give some increased value to the sets; though, as might be expected, it is far from being a catalogue of the *species*, only the name of the order or genus being mentioned for the greater number. In describing his new genus, which is designated '*Purdiea*,' Dr. Planchon suggests that the genus *Sarracenia* has an "immediate affinity" with *Pyrola*. His views are not fully explained; but it seems that he regards *Sarracenia*, *Pyrola*, *Monotropa*, *Dionæa* and *Drosera* as nearly allied genera, and therefore all closely related to *Ericaceæ*, with which it has been usual to associate two of them, namely, *Pyrola* and *Monotropa*. In his new work, 'The Vegetable Kingdom,' Dr. Lindley places *Sarraceniaceæ* between *Papaveraceæ* and *Ranunculaceæ*. But in his 'Natural System,' dated in 1836, he had pointed out the relationship of *Sarracenia* to *Dionæa*, which latter genus is referred to *Droseraceæ* in 'The Vegetable Kingdom.' After all, it is a question of convenience or caprice, not of nature, whether *Pyrola* should be associated more closely with *Sarracenia* or with *Erica*. We can scarcely conceive any botanist bringing *Sarraceniaceæ* into the *Erical* alliance; but we may more readily concur with those who would remove *Pyrolaceæ* and *Monotropaceæ* therefrom, and associate them with *Droseraceæ* and *Sarraceniaceæ* — an alliance of oddities.

C.

Botanical Notes. By E. S. WILSON, Esq.

HAVING paid some attention this year to the two allied species of *Cardamine*, *hirsuta* and *sylvatica*, I send you the following result of my observations.

Of a hundred specimens of *C. hirsuta*, gathered at different times, and in various localities, eighty-seven had their stems and pods perfectly smooth; eleven had them both hairy, and the remaining two had the stems hairy and the pods smooth. Of the same number of specimens of *C. sylvatica*, taken in the same way, not one had the stems otherwise than hairy, nor the pods otherwise than glabrous.

I have lately been made acquainted with a fact of some botanical interest, which I will not suppress, though it seems to lead to no conclusion. About two miles from Congleton is the village of Daneinshaw, so called from the little river of that name, which runs through

it. At the upper end of the village stands the mill; and behind the mill is a long, narrow slip of meadow land, bounded on one side by the river, and on the other by a hanging wood. Between the wood and the meadow runs the mill-race, or artificial channel which conveys the water to the wheel. The country beyond is of a remarkably wild and sylvan character. I was told by a gentleman residing in Congleton, that in the spring of last year he found a blue-flowered anemone in this meadow; that he carried the plant home to his garden, where it perished during the winter. My informant does not profess to be a botanist, and therefore could not say whether the plant was, or was not, *A. apennina*; but to this extent he was quite sure, that it was not one of the common purple-tinged varieties of *A. nemorosa*. The colour of the flower was a clear azure blue. During the present year I have repeatedly searched the adjoining woods and fields for another specimen, but without success. On the last occasion I observed *Ribes rubrum* in half-a-dozen places along the mill-race, and the recollection of Dr. Bromfield's interesting paper led me to examine it with some attention. I was unable, however, to detect any of the characters mentioned by your correspondent, except that the perianths were slightly tinged with brownish purple.

May I call the attention of your readers to a form of *Myosotis*, which occurs not unfrequently in damp meadows? It belongs to the group with small flowers and short pedicels, and has hitherto, I believe, been referred to *M. versicolor*, which in many respects it resembles, but has the calyx much less deeply cleft, and the opening flower white instead of yellow. It also begins to flower about three weeks later. From *M. collina* it is effectually distinguished by its closed calyx; besides that the opening flower in that species, as in all the other British *Myosotides*, is pink. When Smith and Hooker speak of *M. versicolor* as occasionally found in wet meadows, there can be no doubt that they allude to the plant of which I am now writing, though they give not a hint of any difference in colour or structure. You shall have specimens as soon as I can procure them.

Last summer I observed *Oxalis corniculata* growing as a weed in the rectory garden, at Astbury. It seemed to grow as freely as *Veronica polita*, or any other garden weed. I was rather surprised at this, having always understood that the plant was confined to the Channel counties. I could not learn whether it was of annual occurrence.

Going through one of our woods a few days ago, I met with a curious state of *Tussilago Farfara*, which was new to me, though perhaps it may not be so to your readers. The peculiarity consisted in

the branched stems, bearing from two to four heads of flowers, on longish stalks. All the lateral heads were plainly of secondary growth, and inferior in size to the terminal one.

Ranunculus Lenormandi, if so it must be called, is plentiful on our peat mosses. Besides the differences already mentioned, the leaves are much rounder and less ivy-like than those of *R. hederaceus*. Talking of these plants, I may perhaps be allowed to observe, that I used to experience great difficulty in drying them, from the curling of the leaves, and the twisting and entangling of the stalks during the process of removal. All this I now avoid by the following simple method: having carefully washed the plant in clear water, I lay it down, while dripping wet, upon a sheet of drying paper, to which, in that state, it will stick like a plaster, and so put it into the press. On the following day, without attempting to detach the half-dried plant from the sheet on which it lies, I take the sheet and plant both together, place them between thick folds of dry paper, and return them to the press. This process I repeat every day, until the specimen is thoroughly dried, when it may be finally removed, as perfect in form and colour as on the day it was gathered. The same method may be employed with all those plants, such as *Callitriche*, the *Potamogetons*, &c., whose weak and flaccid habit makes them difficult to deal with by the ordinary process.

E. S. WILSON.

Buglawton, Congleton,
May 13, 1846.

Linnaea borealis, &c., on Ben Beck, Braemar.

By WILLIAM GARDINER, Esq.

ON the 28th of July last I found this sweetest gem of our native Flora in considerable abundance on Ben Beck, a hill bounding the valley of Castleton, on the south-east. The station is not ten minutes walk from the village, the plants spreading over little hillocks, among birch trees, about half-way up the hill, and were at the above date partly out of flower. I am not aware that this locality has been noticed before. *Pyrola media*, minor and secunda also occur upon this hill, and among the more interesting cryptogamic plants observed were *Tetraphis pellucida*, *Hookeria lucens*, *Hypnum cordifolium*, *B. purpureum*, *Splachnum mnioides*, *Dicranum scoparium*, *B. fuscescens*, *Jungermannia minuta*, *concinata*, *Taylori*, *ciliaris*, *multifida* and *bicuspidata*, *Gyrophora erosa*, *pellita*, *cylindrica*, *polyphylla* and pro-

boscidea, *Cornicularia tristis*, *bicolor*, *aculeata* and *lanata*, *Lecidea silacea*, *Æderi* and *sanguinaria*, *Nephroma resupinata*, *Peltidea scutata* and various other mosses, lichens and *Hepaticæ*.

After examining numerous specimens of the three lichens known as *Lecidea confluens*, *silacea* and *Æderi*, I could not discover any good marks of distinction, except in the colour of the crust, and even that is not constant. Frequently the forms with a cinereous, yellow and orange-red thallus may be seen distinct enough upon the same rock, but in other cases the cinereous is seen blending into the yellow and the orange-red. The apothecia are much alike in all, though varying in form and size. They are at first flat, with a narrow, entire, elevated border, afterwards convex, and where they become confluent, angular. The yellow form, or *L. silacea*, has frequently soredia resembling the apothecia of *Urceoloria*.

WILLIAM GARDINER.

Dundee, May 16th, 1846.

Note on Equisetum variegatum of Weber and Mohr.

By EDWARD NEWMAN.

I am indebted to the kindness of the Rev. Mr. Cresswell, of Salcombe vicarage, near Sidmouth, for an interesting series of the true *Equisetum variegatum* of Weber and Mohr, the erect, aquatic form of the plant which had previously occurred to botanists only on the banks of the Dee, in Kincardineshire, and in the Dublin canal. The specimens received on the 20th of March were in full flower, indeed, perhaps, rather passed perfection, so that this form of unbranched *Equisetum* must be regarded as one of the earliest in flowering. Mr. Cresswell's note, copied below, contains a most interesting observation on this subject.

I may remark that Mr. Moore, of Dublin, still continues to regard this form as a distinct species of *Equisetum*; cultivating it in company with the more feeble and prostrate form called 'arenarium,' he finds both plants preserve their respective habits and characters: I am not desirous of enforcing my opinion against that of so distinguished a botanist, but feel disinclined to the multiplication of names, except on very clear evidence: it may, however, be observed that in the present instance Mr. Moore will scarcely propose an additional

name, since the erect form is certainly the type of *Equisetum variegatum*, and the *only* form known by the authors of that name; and the prostrate plant has been described as *Equisetum arenarium*, this name also being restricted to one form.

EDWARD NEWMAN.

9, Devonshire Street, City,

April 20, 1846.

Mr. Cresswell's note.

"I TAKE the liberty of enclosing for your inspection the accompanying *Equisetum*, of which I can find no exact description in your volume of 'British Ferns.' It appears to me to hold a position very near your *Equisetum variegatum*, var. *Wilsoni*. It does not, however, exactly accord with that, being, I should suppose, more slight and weak.

I know of only one locality for the plant, which grows on the undercliff facing the sea, in a small muddy stream issuing from beneath the overlying green sand formation, about 200 feet above the sea, and more than 200 from the top of the cliff.

I enclose you fronds in almost every state, in order that you may see how much it varies in size and branching; you will also see that the branches are often fertile, in which it appears to differ from *E. Wilsoni*. The greater number of fronds are not branched at all.

I first observed the plant in August last, when I found the fructification rare, and generally unripe. In November more capsules were ripe, and to day, March 19, it appears to me to be in the greatest perfection.

I may also observe that in the same spot, and growing with this plant, I found fertile fronds of *E. Telmateia*, one of which was eighteen inches long. The cliff faces direct south. The dark green verdure of the *Equisetum* sent, contrasted strongly with the brown, dead leaves of *Arundo Phragmitis* and the last year's fronds of *E. Telmateia*.

R. CRESSWELL."

Salcombe Vicarage, Sidmouth, Devon,

March 19th, 1846.

Notice of 'Twenty Lessons on British Mosses.' By WM. GARDINER, Dundee, illustrated with specimens. Dundee: Mathers, 1846.

THIS is one of those unpretending little volumes which are almost sure to win their way to the good graces of all into whose hands they fall. It does not claim to be a descriptive list of our mosses or a detailed account of their structure. It makes no pretensions to be considered a work of science: or to rank as authority. It is exactly such a simple, unassuming discourse as a botanist might address to his children when wandering with them in the woods, and such also as he might exemplify and illustrate with the mosses he would find around him on all sides. But we shall allow Mr. Gardiner to speak for himself.

"MY DEAR YOUNG READERS,

"You have doubtless, in some of your rural walks, noticed the little mosses, that, in the beautiful woods, cover the ground with a fresh green carpet, and adorn the tops of old walls with their lovely verdure. But, perhaps, you have not examined them attentively, nor are aware that there are so many kinds of them, all differing from one another in the structure of their various parts. It shall be my object in these lessons to lead you to a better acquaintance with them.

"Possibly you may have often passed them by with little more than a heedless glance,—thinking that, because there were plenty of bright-coloured flowers and stately trees around to delight your eye, the humble moss was scarcely worth your attention. Because things are small or humble, however, they should not be treated with contempt nor carelessness. God made the little moss as well as the glowing flower and lofty tree, and He has made nothing in vain. We may not know all the uses for which such tiny things were created, but we know some of them. We love what is beautiful, for God has implanted in our minds that love; and in the structure of the mosses, as well as in that of many others of his smallest works, there is a very great deal of beauty. We love them, therefore, because it is natural for us to love what is beautiful. This love yields us true pleasure, which constitutes our earthly happiness, and ought to awaken our gratitude to the benevolent Creator, who hath so kindly provided for our purer gratifications.

"Mosses are found in all parts of the world; and in Britain alone, there are about 400 different kinds. Their places of growth are as varied as their forms. Some are found in the deepest valleys, by the sides of lonely streams, or within the spray-clouds of roaring water-

falls; others brave the tempests of lofty mountain summits, or seek shelter among their shelving rocks; many court the shade of the forest, or nestle about the roots of the hedge-rows; whilst various species seek the open fields or the sunny wall-tops, or have their homes in the deep morass, or dwell on the sandy shores of the mighty ocean."—p. 5.

"*The Structure of Mosses.*—A moss, like plants of a larger growth, is furnished with a root, stem and leaves, and, in place of a flower, has a little vessel usually supported on a stalk, and containing the seeds. The stems vary from the twentieth part of an inch to a foot in height, but not many of them exceed three or four inches. The leaves are in some kinds nearly round; in others *ovate*, or egg-shaped; *oblong*, or longer than broad; *lanceolate*, or lance-shaped; *subulate*, or awl-shaped; *setaceous*, or bristle-shaped, and of various other forms. Some of them are beautifully reticulated or netted, which is best seen under a microscope. They are often furnished with a nerve or midrib, which varies in length,—in some shorter than the leaf, in others longer. In colour, they are found from the palest tint of green to the darkest, and even brown, purple, or nearly black. Their edges are frequently *denticulated*, or toothed, or *serrated*, or notched like a saw, and their direction straight or curved.

"The little vessel containing the seeds is called the *capsule*, or fruit, and the stalk which supports it the *seta*, or fruit-stalk. The capsule is covered by a hood, called the *calyptra*, or veil; and when this is pulled off, or falls off, we see an *operculum*, or lid covering the mouth of the capsule. When the lid is removed, we find the mouth of the capsule either surrounded with a number of little teeth, or naked. The teeth are named the *peristome*, or fringe, and are in number 4, 8, 16, 32, or 64. They are variable in length and form in the different kinds of mosses, and either in a single or double row. Their use is to protect the seeds in moist weather, which you will see by merely breathing upon a capsule, when its fringe is expanded in the sunshine,—the slight moisture of your breath making the little teeth instantly close over its mouth. The seeds are very small and simple, having no lobes nor germ like the pea and bean. In dry, sunny weather, the fringe opens, and the ripe seeds are scattered abroad by the gentle winds, and wafted to places fitted for their abode, where in time they put forth their delicate stems and leaves. These mosses, when fully grown, produce, like their parents, little capsules filled with seeds, and these seeds again in due season spring up into other mosses of the same kind, and thus continue to perpetuate their species and adorn their chosen homes."—p. 7.

Specimens of the capsule, seta, calyptra, operculum and peristome are neatly gummed on the paper, and illustrate the description.

Twenty species of mosses are more minutely described, and a specimen accompanies each description; the following are selected as examples:—

“Encalypta vulgaris.—Common Extinguisher Moss. This genus is so named because the veil or calyptra covers the capsule in the same way as we cover the flame of a candle by what is called an extinguisher, to put it out. The fringe has sixteen short teeth, and the veil is entire at the base,—the other four species, which are alpine, having the base of the veil toothed. This grows upon wall-tops, and early in the spring is found along with the little *Draba verna*, almost the earliest of our spring flowers, and perhaps the smallest,—its white blossoms and diminutive seed-pods being often produced on stems a quarter of an inch high. About the time when these two plants are found in perfection, we listen with delight to the far-off lark filling the blue heavens with its cheerful melody, and the happy thrush pouring from the topmost branch of some yet leafless tree its sprightly song. There is thus, you will perceive, a great deal of pleasure connected with plants, besides what we derive from contemplating their own beauty. We associate them in our minds with the scenery amid which they grow, the season in which they are gathered, and other circumstances; which, for many a day or even year afterwards, affords us the most pleasant reflections.”—p. 17.

“Weissia nigrita.—Black-fruited Weissia. The genus Weissia is named in honour of a German botanist, Weiss, and includes about twenty native species. The fringe has sixteen teeth, placed round the mouth of the capsule at equal distances, and are mostly short. The Weissia nigrita derives its specific name from the mature capsule being of a black colour. It is a very rare moss, being found only in a few places. It is said to grow on the mountains near Blair in Atholl, forty miles inland; and the specimen here given is from the Sands of Barrie, on the coast of Forfarshire. This is a remarkable circumstance, and shows that the climate of the lofty mountain and that of the sea-shore are very similar.

“Many mosses, as well as flowers, are so common that they are found all over the country; others are only met with here and there; while some are so rare, that they are found but in a few particular places. The place where a plant is found is called its *locality*. The Sands of Barrie is one locality for the black-fruited Weissia—the mountain, Ben-y-Gloe, is said to be another.

"Sir James E. Smith, the author of the 'English Flora,' observes, that 'a plant gathered in a celebrated or delightful spot, is like the hair of a friend, more dear to memory than even a portrait, because it excites the imagination without presuming to fill it.' When we look upon this little moss, neither its own simple beauty, nor that of the various species with which it has a family relation, alone engage the attention, for before it flits glorious remembrances or imaginative anticipations of magnificent Highland mountains and ocean shores."—p. 19.

"*Fissidens bryoides*. Small Fern-leaved Fork Moss, or Mungo Park's Moss. — This pretty little moss is found in various parts of the world. Even in the sandy deserts of Africa, it is met with; and we are told by that intrepid traveller, Mungo Park, that the contemplation of its beauty was at one time the means of preserving his life. Plundered by banditti, worn out with fatigue, and surrounded by all the horrors of the desert, his courage almost failed him, and he sat down to rest his weary limbs, and ponder on his destitute condition. 'At this moment,' he says, 'painful as my reflections were, the extraordinary beauty of a small moss irresistibly caught my eye; and though the whole plant was not larger than the tip of one of my fingers, I could not contemplate the delicate conformation of the roots, leaves, &c., without admiration. Can that Being (I thought) who planted, watered, and brought to perfection, in this obscure part of the world, a thing of so small importance, look with unconcern upon the situation and sufferings of creatures formed after his own image? Surely not! Reflections such as these would not allow me to despair: I started up, and, disregarding both hunger and fatigue, travelled forwards, assured that relief was at hand, and I was not disappointed.'

"*Fissidens* is closely allied to *Dicranum*, and both are named from the sixteen teeth of the fringe being *bifid*, or divided like a fork. There are several species, and the leaves of all are very curious in their structure, the upper half being double, or composed as it were of two plates or leaves.

"This grows diffusedly spread over shady banks, particularly under the shade of hedges and woods, and is met with in fructification at various seasons. It is an exquisite little moss, and cannot fail to strike with admiration any one who will bestow upon it an attentive examination."—p. 27.

In conclusion, we heartily recommend this little publication to the notice of our readers, as one of the prettiest botanical presents that could be made to their juvenile acquaintance.

K.

Microscopical Society, May 13th, 1846.

J. S. Bowerbank, Esq., President, in the chair.

This evening a paper by E. J. Quekett, Esq., entitled "Some Observations on the microscopic appearances in diseased Potatoes of the present season" was read. After some preliminary observations, Mr. Quekett went on to state that if a section be made of a potato in which the disease is only just commencing, it will be observed that a large quantity of fluid follows the incision, and that many minute points, of a brown colour, of various sizes, may be detected in the cut surface. As the disease advances, these spots become larger, those on the surface being of a brownish black, and exhibiting evident marks of the commencement of decomposition in them. If very thin sections of the interior diseased portions be submitted to the microscope, it will be seen that certain cells, beside containing grains of starch, have for the most part their walls lined with a brown, granular matter, the particles being very minute. In a section from the exterior, where the marks of the disease have become very manifest, all the cells are found to be of this brown colour, and masses of irregular, grumous matters occupy their interior. Upon close examination tubes may be discovered between the cells, containing minute granules, which tubes branch according to the interspaces of the cells, and it often occurs that the interspaces appear to be filled with granules alone. These appearances are referred by Mr. Quekett to the presence of minute fungi, whose growth is exceedingly rapid, and which appear under the forms of particles, sporidia and filaments. The particles, which are not $\frac{1}{3000}$ of an inch in diameter, appear to compose the greater portion of the mass of diseased structure: they require a power of at least 300 linear to separate them. The sporidia are of various sizes, the larger a little curved, and containing some nuclei or cytoblasts within, and probably are species of the genus *Fusarium*. The filaments are jointed and branched, and contain granular matter. A minute fungus, having filaments, bearing globular heads containing sporules, apparently belonging to some species of *Botrytis*, is also frequently seen on the exterior. The author then proceeded to state

the opinions of various writers on this subject, and gave as the result of his own observations that the origin of the disease was evidently connected with the appearance of a ramifying, filamentous fungus, that the brown spots indicative of the same are secondary, and that the decay arises from the vitality of the cells being destroyed by the presence of the fungus; and he concluded by adducing various facts in proof of the correctness of his particular views.

J. W.

An Arrangement of the British Flora in accordance with the Alliances and Orders of Professor Lindley's 'Vegetable Kingdom.'

PROFESSOR Lindley's great work, 'The Vegetable Kingdom,' is so certain to take rank among those of the highest authority in relation to systematic Botany, that we have thought it would prove serviceable to the readers of the 'Phytologist,' to have before them a list of the classes and alliances now recognized by the learned author of that work; together with a list of such of the orders and genera as are represented by species in the British Flora; but shortening the lists of genera by omitting those of the cellular plants, and also such among the vascular plants as fall under orders almost invariably recognized and adopted by systematic authors, and hence sufficiently familiar; for example, the numerous genera of Graminaceæ and Astéraceæ, or grasses and syngenesious plants, which are always brought together in systems of classification.

By separating the leaf-bearing cryptogamic plants from the rest; the reticulate-veined monocotyledons from such as bear leaves with parallel veins; the Coniferæ and Cycadeaceæ from other exogens; and by taking *Rafflesia*, *Cytinus*, *Balanophora* and their allies, for a distinct class of themselves; the author of 'The Vegetable Kingdom' forms seven primary groups, instead of the trinitarian number more usually received. The following characters are given for these seven "CLASSES."

Asexual, or Flowerless Plants.

- | | |
|--|----------------|
| Stems and leaves undistinguishable | 1. THALLOGENS. |
| Stems and leaves distinguishable | 2. ACROGENS. |

Sexual, or Flowering Plants.

- | | |
|---|---------------|
| Fructification springing from a thallus | 3. RHIZOGENS. |
| Fructification springing from a stem. | |

Wood of stem arranged in a confused manner, youngest in the centre, cotyledon single.

Leaves parallel-veined, permanent; root much like the stem internally 4. ENDOGENS.

Leaves net-veined, deciduous; root with the wood in a solid, concentric circle 5. DICTYOGENS.

Wood of stem arranged in a concentric, or uniform manner, youngest at the circumference; cotyledons two or more.

Seeds quite naked 6. GYMNOGENS.

Seeds enclosed in seed-vessels 7. EXOGENS.

Class 1. THALLOGENS.

Alliance 1. Algaes.—The Algal Alliance.

1. Diatomaceæ, Brittleworts.
2. Confervaceæ, Confervas.
3. Fucaceæ, Seawracks.
4. Ceramiaceæ, Rosetangles.
5. Characeæ, Charas.

Alliance 2. Fungales.—The Fungal Alliance.

6. Agaricaceæ. (Hymenomycetes). Toadstools.
7. Lycoperdaceæ. (Gasteromycetes). Puff-balls.
8. Uredinaceæ. (Coniomycetes). Blights.
9. Botrytaceæ. (Hyphomycetes). Mildews.
10. Helvellaceæ. (Ascomycetes). Morels.
11. Mucoraceæ. (Physomycetes). Moulds.

Alliance 3. Lichenales.—The Lichenal Alliance.

12. Graphidaceæ, Letter-Lichens.
13. Collemaeæ, Jelly-Lichens.
14. Parmeliaceæ, Leaf-Lichens.

Class 2. ACROGENS.

Alliance 4. Muscales.—The Muscal Alliance.

15. Ricciaceæ, Crystalworts.
16. Marchantiaceæ, Liverworts.
17. Jungermanniaceæ, Scalemosses.

- 18. Equisetaceæ, Horsetails.—Gen. Equisetum.
- 19. Andræaceæ, Splitmosses.—Gen. Andræa.
- 20. Bryaceæ, Urnmosses.—(Musci).
- Alliance 5. Lycopodales.—The Lycopodal Alliance.
 - 21. Lycopodiaceæ, Clubmosses.—Gen. Lycopodium.
 - 22. Marsileaceæ, Pepperworts. Gen. Pilularia, Isoetes.
- Alliance 6. Filicales.—The Filical Alliance.
 - 23. Ophioglossaceæ, Adders' Tongues.—Gen. Ophioglossum, Botrychium.
 - 24. Polypodiaceæ, Ferns.—Gen. Osmunda; with all the dor-siferous ferns of Britain.

Class 3. RHIZOGENS.

(N. B.—The only class which has no British species to represent it, and which includes only fifty-three described species in the whole. This class is not divided into alliances, consequently the numbers of the latter are uninterrupted by the omission of the three orders of the Rhizogens).

Class 4. ENDOGENS.

- Alliance 7. Glumales.—The Glumal Alliance.
 - 29. Graminaceæ, Grasses.
 - 30. Cyperaceæ, Sedges.
 - 33. Eriocaulaceæ, Pipeworts.—Gen. Eriocaulon.
- Alliance 8. Arales. The Aral Alliance.
 - 34. Pistiaceæ, Lemnads, or Duckweeds.—Gen. Lemna.
 - 35. Typhaceæ, Typhads, or Bullrushes.—Gen. Typha. Spar-ganium.
 - 36. Araceæ, Arads.—Gen. Arum.
- Alliance 9. Palmales.—The Palmal Alliance.
- Alliance 10. Hydrales.—The Hydral Alliance.
 - 39. Hydrocharidaceæ, Hydrocharads.—Gen. Stratiotes, Hy-drocharis.
 - 40. Naiadaceæ, Naiads.—Gen. Zannichellia.
 - 41. Zosteraceæ, Seawracks.—Gen. Zostera.
- Alliance 11. Narcissales.—The Narcissal Alliance.
 - 46. Amaryllidaceæ, Amaryllids.—Gen. Galanthus, Leucojum, Narcissus.
 - 47. Iridaceæ, Irids.—Gen. Iris, Trichonema, Crocus.
- Alliance 12. Amomales.—The Amomal Alliance.

Alliance 13. Orchidales.—The Orchidal Alliance.

52. Orchidaceæ, Orchids.

Alliance 14. Xyridales.—The Xyridal Alliance.**Alliance 15. Juncales.—The Juncal Alliance.**58. Juncaceæ, Rushes.—Gen. *Luzula*, *Juncus*, *Narthecium*.59. Orontiaceæ, Orontids.—Gen. *Acorus*.**Alliance 16. Liliales.—The Lilial Alliance.**61. Melanthaceæ, Melanths.—Gen. *Tofieldia*, *Colchicum*.62. Liliaceæ, Lilyworts.—Gen. *Tulipa*. *Gagea*. *Lloydia*. *Fritillaria*. *Lilium*. *Allium*. *Scilla*. *Ornithogalum*. *Muscari*. *Agraphis*. *Asparagus*. *Polygonatum*. *Convallaria*. *Ruscus*.**Alliance 17. Alismales.—The Alismal Alliance.**64. Butomaceæ, Butomads.—Gen. *Butomus*.65. Alismaceæ, Alismads.—Gen. *Alisma*. *Sagittaria*. *Damasonium*.66. Juncaginaceæ, Arrow-grasses.—Gen. *Triglochin*. *Scheuchzeria*. *Ruppia*. *Potamogeton*.**Class 5. DICTYOGENS.****Alliances? (None indicated in a class so small).**68. Dioscoreaceæ, Yams.—Gen. *Tamus*.71. Trilliaceæ, Parids.—Gen. *Paris*.**Class 6. GYMNOGENS.****Alliances? (None indicated).**74. Pinaceæ, Conifers.—Gen. *Pinus*. *Juniperus*.75. Taxaceæ, Taxads.—Gen. *Taxus*.**Class 7. EXOGENS.****Alliance 18. Amentales.—The Amental Alliance.**78. Betulaceæ, Birchworts.—Gen. *Betula*. *Alnus*.80. Salicaceæ, Willowworts.—Gen. *Salix*. *Populus*.81. Myricaceæ, Galeworts.—Gen. *Myrica*.82. Elæagnaceæ, Oleasters.—Gen. *Hippophæe*.**Alliance 19. Urticales.—The Urtical Alliance.**84. Urticaceæ, Nettleworts.—Gen. *Urtica*. *Parietaria*.85. Ceratophyllaceæ, Hornworts.—Gen. *Ceratophyllum*.86. Cannabinaceæ, Hempworts.—Gen. *Humulus*.

- Alliance 20. Euphorbiales.—The Euphorbial Alliance.
 90. Euphorbiaceæ, Spurge­worts.—Gen. Euphorbia. Mercu­
 rialis. Buxus.
 92. Callitrichaceæ, Starworts.—Gen. Callitriche.
 93. Empetraceæ, Crowberries.—Gen. Empetrum.
- Alliance 21. Quernales.—The Quernal Alliance.
 95. Corylaceæ, Mastworts.—Gen. Carpinus. Corylus. Fagus.
 Quercus.
- Alliance 22. Garryales.—The Garryal Alliance.
- Alliance 23. Menispermals.—The Menispermal Alliance.
- Alliance 24. Cucurbitales.—The Cucurbit­al Alliance.
 105. Cucurbitaceæ, Cucurbits.—Gen. Bryonia.
- Alliance 25. Papayales.—The Papayal Alliance.
- Alliance 26. Violales.—The Violal Alliance.
 116. Violaceæ, Violetworts.—Gen. Viola.
 117. Frankeniaceæ, Frankeniads.—Gen. Frankenia.
 118. Tamaricaceæ, Tamarisks.—Gen. Tamarix.
 120. Crassulaceæ, Houseleeks.—Gen. Tillæa. Cotyledon.
 Sedum. Sempervivum.
- Alliance 27. Cistales.—The Cistal Alliance.
 122. Cistaceæ, Rock-roses.—Gen. Helianthemum.
 123. Brassicaceæ, Crucifers.—Gen. Those of the Linnæan
 class ‘Tetradynamia.’
 124. Resedaceæ, Weldworts.—Gen. Reseda.
- Alliance 28. Malvales.—The Malval Alliance.
 130. Malvaceæ, Mallowworts.—Gen. Malva. Althæa. Lava-
 tera.
 131. Tiliaceæ, Lindenblooms.—Gen. Tilia.
- Alliance 29. Sapindales.—The Sapindal Alliance.
 133. Polygalaceæ, Milkworts.—Gen. Polygala.
 138. Aceraceæ, Maples.—Gen. Acer.
- Alliance 30. Guttiferales.—The Guttiferal Alliance.
 146. Hypericaceæ, Tutsans.—Gen. Hypericum. Parnassia.
- Alliance 31. Nymphales.—The Nymphal Alliance.
 148. Nymphæaceæ, Waterlilies.—Nymphæa. Nuphar.
- Alliance 32. Ranales.—The Ranal Alliance.
 154. Ranunculaceæ, Crowfoots.—Gen. Those of the ‘London
 Catalogue of British Plants.’
 146. Papaveraceæ, Poppyworts.—Gen. Chelidonium. Meco-
 nopsis. Papaver. Rœmeria. Glaucium.
- Alliance 33. Berberales.—The Berberal Alliance.

157. Droseraceæ, Sundews.—Gen. Drosera.
158. Fumariaceæ, Fumeworts.—Gen. Corydalis. Fumaria.
159. Berberidaceæ, Berberids.—Gen. Berberis. Epimedium.
- Alliance 34. Ericales.—The Erical Alliance.
166. Pyrolaceæ, Wintergreens.—Gen. Pyrola.
168. Monotropaceæ, Fir-rapes.—Gen. Monotropa.
169. Ericaceæ, Heathworts.—Gen. Erica. Calluna. Menziesia. Andromeda. Arbutus. Arctostaphylos. Azalea.
- Alliance 35. Rutales.—The Rutal Alliance.
181. Elatinaceæ, Water-peppers.—Gen. Elatine.
- Alliance 36. Geraniales.—The Geranial Alliance.
183. Linaceæ, Flaxworts.—Gen. Linum. Radiola.
185. Oxalidaceæ, Oxalids.—Gen. Oxalis.
186. Balsaminaceæ, Balsams.—Gen. Impatiens.
187. Geraniaceæ, Cranesbills.—Gen. Erodium. Geranium.
- Alliance 37. Silenales.—The Silenal Alliance.
188. Caryophyllaceæ, Cloveworts. — Gen. Sagina. Alsine. Arenaria. Mohringia. Holosteum. Stellaria. Cerasium. Malachium. Dianthus. Saponaria. Silene. Agrostemma. Lychnis. Cucubalus.
189. Illecebraceæ, Knotworts.—Gen. Corrigiola. Herniaria. Illecebrum. Polycarpon. Spergula.
190. Portulacaceæ, Purslanes.—Gen. Montia.
191. Polygonaceæ, Buckwheats.—Gen. Oxyria. Polygonum. Rumex.
- Alliance 38. Chenopodales.—The Chenopodal Alliance.
194. Amarantaceæ, Amaranths.—Gen. Amaranthus.
195. Chenopodiaceæ, Chenopods.—Gen. Salicornia. Atriplex. Halimus. Beta. Chenopodium. Schoberia. Salsola.
- Alliance 39. Piperales.—The Piperal Alliance.
- Alliance 40. Ficoidales.—The Ficoidal Alliance.
202. Scleranthaceæ, Scleranthus.—Gen. Scleranthus.
- Alliance 41. Daphnales.—The Daphnal Alliance.
203. Thymelaceæ, Daphnads.—Gen. Daphne. Mezereum.
- Alliance 42. Rosales.—The Rosal Alliance.
209. Fabaceæ, Leguminous plants.—Gen. All the genera of papilionaceous flowers, or the Linnean class of Diadelphia Decandria, in English Floras.
210. Drupaceæ, Almondworts.—Gen. Prunus. Cerasus.
211. Pomaceæ, Appleworts.—Gen. Pyrus. Mespilus. Coto-neaster. Cratægus.

212. Sanguisorbaceæ, Sanguisorbs.—Gen. *Alchemilla*. *Sanguisorba*. *Poterium*.
213. Rosaceæ, Roseworts.—Gen. *Rosa*. *Rubus*. *Fragaria*. *Comarum*. *Potentilla*. *Sibbaldia*. *Agrimonia*. *Geum*. *Spiræa*.
- Alliance 43. Saxifragales.—The Saxifragal Alliance.
214. Saxifragaceæ, Saxifrages.—Gen. *Saxifraga*. *Chrysosplenium*.
218. Lythraceæ, Loosestrifes.—Gen. *Peplis*. *Lythrum*.
- Alliance 44. Rhamnales.—The Rhamnal Alliance.
221. Ulmaceæ, Elmworts.—Gen. *Ulmus*.
222. Rhamnaceæ, Rhamnads.—Gen. *Rhamnus*.
225. Celastraceæ, Spindle-trees.—Gen. *Euonymus*.
- Alliance 45. Gentianales.—The Gentianal Alliance.
230. Aquifoliaceæ, Hollyworts.—Gen. *Ilex*.
231. Apocynaceæ, Dogbanes.—Gen. *Vinca*.
235. Orobanchaceæ, Broomrapes.—Gen. *Orobanche*. *Lathræa*.
236. Gentianaceæ, Gentianworts.—Gen. *Gentiana*. *Cicendia*. *Erythræa*. *Chlora*. *Menyanthes*. *Villarsia*.
- Alliance 46. Solanales.—The Solanal Alliance.
237. Oleaceæ, Oliveworts.—Gen. *Ligustrum*. *Fraxinus*.
238. Solanaceæ, Nightshades.—Gen. *Hyoscyamus*. *Solanum*. *Atropa*.
241. Convolvulaceæ, Bindweeds.—Gen. *Calystegia*. *Convolvulus*.
242. Cuscutaceæ, Dodders.—*Cuscuta*.
243. Polemoniaceæ, Phloxworts.—Gen. *Polemonium*.
- Alliance 47. Cortusales.—The Cortusal Alliance.
245. Plumbaginaceæ, Leadworts.—Gen. *Armeria*. *Statice*.
246. Plantaginaceæ, Ribworts.—Gen. *Littorella*. *Plantago*.
247. Primulaceæ, Primworts.—Gen. *Primula*. *Cyclamen*. *Glaux*. *Lysimachia*. *Trientalis*. *Centunculus*. *Anagallis*. *Hottonia*. *Samolus*.
- Alliance 48. Echiales.—The Echial Alliance.
253. Boraginaceæ, Borageworts.—Gen. *Echium*. *Pulmonaria*. *Steenhammaria*. *Lithospermum*. *Lycopsis*. *Anchusa*. *Myosotis*. *Symphytum*. *Borago*. *Asperugo*. *Cynoglossum*.
255. Lamiaceæ, Labiates.—Gen. *Salvia*. *Lycopus*; together with all the genera included under ‘*Didynamia Gymnospermia*,’ in English Floras, except *Verbena*.

256. Verbenaceæ, Verbenes.—Gen. Verbenæ.
 Alliance 49. Bignoniales.—The Bignonial Alliance.
 264. Scrophulariaceæ, Figworts.—Gen. Verbascum. Veronica;
 together with the genera included under 'Didynamia
 Angiospermia,' except Linnæa, Lathræa, Orobanche.
 265. Lentibulariaceæ, Butterworts.—Gen. Utricularia. Pingu-
 cula.
 Alliance 50. Campanales.—The Campanal Alliance.
 266. Campanulaceæ, Bellworts.—Gen. Jasione. Wahlenbergia.
 Specularia. Phyteuma. Campanula.
 267. Lobeliaceæ, Lobeliads.—Gen. Lobelia.
 270. Valerianaceæ, Valerianworts.—Gen. Valerianella. Cen-
 tranthus. Valeriana.
 271. Dipsacaceæ, Teazelworts. — Gen. Dipsacus. Knautia.
 Scabiosa.
 273. Asteraceæ, Composites.—Gen. Xanthium; together with
 those placed under the Linnean class of 'Syngenesia,' in
 all recent works on British Botany.
 Alliance 51. Myrtales.—The Myrtal Alliance.
 277. Haloragaceæ, Hippurids.—Gen. Hippuris. Myriophyllum.
 278. Onagraceæ, Onagrad. — Gen. Isnardia. Cœnothera. Epi-
 lobium. Circæa.
 Alliance 52. Cactales.—The Cactal Alliance.
 Alliance 53. Grossales.—The Grossal Alliance.
 287. Grossulariaceæ, Currantworts.—Gen. Ribes.
 Alliance 54. Cinchonales.—The Cinchonol Alliance.
 291. Vacciniaceæ, Cranberries.—Gen. Oxycoccus. Vaccinium.
 294. Caprifoliaceæ, Caprifolds.—Gen. Linnæa. Caprifolium.
 Lonicera. Viburnum. Sambucus.
 295. Galiaceæ, Stellates.—Gen. Galium. Rubia. Asperula.
 Sherardia.
 Alliance 55. Umbellales.—The Umbellal Alliance.
 296. Apiaceæ, Umbellifers.—Gen. The Umbelliferous plants,
 placed under 'Pentandria Digynia.'
 297. Araliaceæ, Ivyworts.—Gen. Hedera. Adoxa.
 298. Cornaceæ, Cornels.—Gen. Cornus.
 Alliance 56. Asarales.—The Asaral Alliance.
 301. Santalaceæ, Sandalworts.—Gen. Thesium.
 302. Loranthaceæ, Loranth. — Gen. Viscum.
 303. Aristolochiaceæ, Birthworts.—Gen. Asarum. Aristolochia.
 Such is the classification of Dr. Lindley, in its bearings upon the

plants of Britain. It will at once be observed that in combining orders into alliances, the author has totally changed the consecutive series usually adhered to, more or less closely, by the botanists of this country. Orders are thus grouped together which have usually been placed far apart. And on the other hand, several equally wide disjunctions have been deemed necessary or expedient. But the changes of genera from one order to another are by no means numerous in proportion: in several instances, such changes in the place of genera occur with those of anomalous or peculiar structural disposition of organs, or in which certain organs are reduced in number or wholly absent. But our immediate object is that of showing what is the new arrangement, not that of criticism upon its details; and we therefore close the abstract without further remark.

C.

Notes on the Lastræa fœnesecii as a species including both forms of Nephrodium fœnesecii (Lowe), and Aspidium dilatatum, var. recurvum, (Bree). By HEWETT C. WATSON, Esq.

WHEN two persons who give their attention to the same facts do yet deduce conflicting opinions therefrom, it may fairly be assumed that some third party must be appealed to for judgment between them. To a certain extent, I find Mr. Newman and myself thus in conflict respecting the specific identity of (the formerly supposed two) ferns above named. The opinions of Mr. Newman are given in a recent number of this periodical (Phytol. ii. 509); and in his paper this gentleman there mentions that I had requested his attention to the subject. In thus making mention of me, he was writing only with reference to one point, in which our views concurred, and therefore he made no allusion to more essential points of non-concurrence. But as in some respects we have got to opposite conclusions, from inspection of the same specimens, I feel desirous to place before the same body of readers that which I deem to be a necessary qualification of Mr. Newman's views.

In order to render the points intelligible, it may be well to first mention briefly some items of the history of the (so considered) species and their names. In the fourth volume of the 'Magazine of Natural History,' published in 1831, the Rev. Mr. Bree figured a fern under the name of "*Aspidium dilatatum, var. recurvum.*" Though he thus named the fern only as a variety, yet in a foot-note he ex-

pressed his opinion that it "is really a distinct species." He there mentioned two characters by which to distinguish it from *dilatatum*, namely, the recurved divisions of the leaflets, and the triangular form of the frond, arising from the larger size of the lower pinnæ.

In the Cambridge 'Philosophical Transactions,' a year or two afterwards, the Rev. Mr. Lowe published a paper which had been read before the Cambridge Society in 1830. In that paper Mr. Lowe described a fern which he had found to be common in Madeira, and to which he gave the new *specific* name of "*sæneseccii*." As he found the frond of his fern assuming two different forms of outline, triangular or oblong, under different conditions of shade, he gave a subordinate name to each form, viz., that of "*alatum*" to the triangular form, and that of "*productum*" to the oblong form. Explicitly and unmistakeably he showed that the triangular form was to be considered the true and typical form of his species "*sæneseccii*"; the other form being, in his opinion, rather a state or monstrosity produced by deficiency of light. He did not confuse his fern with the *dilatatum* or *spinulosum* of authors, but expressly stated it to be distinct from both.

Very recently it has been suggested that Bree's fern and Lowe's fern are identical species; and assuming this identity admitted, the question arises, 'what is the proper specific name of the united species?' Mr. Bree gave no specific name to his fern, but treated it as a variety of *dilatatum*, shortly and imperfectly distinguished from the latter. On the contrary, Mr. Lowe published his fern unhesitatingly as an undescribed species, invented a specific name, and drew out a scientific character and elaborate description. Mr. Lowe's name and description enjoyed the priority of a semi-publication through being read to the Cambridge Society; but Mr. Bree's name had priority in printed publication.

Under these circumstances, were the question one of simple priority of name, it might be more advisable to adopt the name first fully published in print. Unfortunately, that name was not imposed as a specific name, nor was it accompanied by any properly constructed specific diagnosis. It thus seems to myself that Mr. Lowe's name of "*sæneseccii*" ought to be retained. He first publicly announced the species, and he first printed a specific name and ample description of the species so announced. Nothing but an earlier *specific* name and description should be allowed to set aside those of Mr. Lowe, and Mr. Bree's name of "*recurvum*" was not such.

Here is my clash of opinion with Mr. Newman. This gentleman would discard the name given to the fern by Mr. Lowe. He does not

make this proposition on the only ground which could be taken up, namely, that Bree's name was first in print. He cashiers the name on the inadmissible argument, that, in his individual opinion, Mr. Lowe included two or more distinct species under the one name of *fœnesecii*. Were Mr. Newman's opinion unquestioned and established, there would still be a breach of botanical usage in re-naming the true typical form of Mr. Lowe's species, which he so carefully points out; though it might afford an ample reason for imposing a different specific name on the other form or forms, erroneously referred to the same species by Mr. Lowe. Of this innovation on botanical usage I will presently speak by illustration, after premising my own more individual objection against the suggestion or practice of Mr. Newman.

I consider Mr. Lowe to have been correct, not in error, when he included both a triangular and an oblong form of frond under one specific name. I must admit myself to be moving on to hazardous ground, in thus placing a negative against the views entertained by one who has so closely and so successfully studied the ferns of Britain, and their synonymes; and who has also inspected the very same specimens which have led me to this contradictory conclusion. But facts are stubborn things, and Mr. Newman has made no allusion to the facts which seem to warrant the different conclusion on my part. Among the specimens submitted to Mr. Newman's examination, from my own herbarium, were those collected in the Azores by myself. Of these no mention is made by Mr. N., although they were the specimens which originally showed me the identity of the English and Madeiran species, being intermediate in size and form between English specimens, for which I was indebted to Mr. Newman, and Madeiran specimens, given to me by Dr. C. Lemann, who knows perfectly well the species of Mr. Lowe. This idea, once formed, was soon converted into conviction by inspection of the larger series of Madeiran specimens in the herbaria of Sir W. J. Hooker and Dr. C. Lemann. And by a letter recently received from Mr. Webb, whose knowledge of the Atlantic Flora is unequalled, I find that accomplished botanist to have independently arrived at the same conclusion.

Now, it so happens, that among my half-dozen Azoric specimens, there is one of the oblong form, in which the lower pinnæ are neither larger nor more compound than those above them; and generally, the Azoric specimens have a more elongated frond than those of Britain. Still, that one with the oblong outline, as well as others, possesses the three characters which Mr. Newman emphatically pronounces, in his last article on the *Lastræa fœnesecii* or *recurva*, to be those "which

immediately distinguish *recurva* from any other aristate *Lastrea*. . . . I allude to the minute, sessile, grain-like glands scattered over both surfaces of the frond: the jagged, eglandulose involucre: and the long, slender, laciniated scales of the stipes" (Phytol. ii. 509). It is true, that on this oblong variety the glands are few, and several of the scales scarcely laciniated at all; but the presence of those specific characters is nevertheless indisputable. As to the jagged edges of the involucre, I fear that will be found an untenable character, between *dilatatum* and *fœnesecii*.

To sum up, I must consider Mr. Lowe's specific name to have all in its favour. The species was first announced by that botanist, as something distinct from *dilatatum* and *spinulosum*. Its first specific name was printed in his paper. He showed unequivocally which was to be taken as the true typical form of his species. The second, or oblong form may be still only a variety of the type, and not specifically distinct. But if distinct, that affords no sufficient reason for changing the specific name of the type.

I have now only to make good the charge of innovation on botanical usage, implied in Mr. Newman's reason for changing the name of Lowe's fern. The pages of the 'Phytologist' have lately included communications about an alleged new species of *Ranunculus*, under name of *R. Lenormandi*. There can be no doubt whatever that this same species has been grouped with another under the common name of *R. hederaceus*. Twice, at least, in this country it has been published as a named variety of the latter. But no botanist has suggested that the older name of *R. hederaceus* should be quashed, as the name applied to "a group of species," or "purposely and advisedly" to what are now received as two species. Nor, in like argument, do those botanists who distinguish *R. fluitans* and *R. circinatus* as species, discard the name of *R. aquatilis*: they merely restrict this latter to the more usual or typical forms, and apply new names to the others.

Under limitations dictated by convenience or certainty, I would agree with Mr. Newman's view, that a name given to a group of species, should be retained for the group; each included species receiving its own specially applied name. But I cannot see that Mr. Lowe's *fœnesecii* should come under the rule, supposing such a rule in force, which is not the case now.

HEWETT C. WATSON.

Thames Ditton, June 8, 1846.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, 14th May, 1846. — Professor Balfour, President, in the chair.

Donations to the library and museum were announced from the Leopoldine Academy of Breslau, and from Alfred Greenwood, Esq.

The following gentlemen were elected Fellows of the Society, viz. :—

James Duncan, M.D., F.R.C.S.E., &c., 12, Heriot Row; Rev. Dr. Fleming, F.R.S.E., M.W.S., 54, India Street; Robert H. Gunning, Esq., 12, Argyll Square; and William Stark Dougall, Esq.

The following communications were read :—

1. Biographical Sketch of the late Professor Graham, by Dr. Ransford.

Robert Graham was the third son of the late Dr. Graham, of Stirling (afterwards Moir of Leckie), and of Mrs. Ann Stewart, daughter of the late Charles Stewart, Esq., of Appin. His early education was obtained at Stirling. He was apprenticed in 1804 to the late Mr. Andrew Wood, F.R.C.S., Edinburgh, and became a licentiate of the College of Surgeons in 1808, and graduated at the University during the same year. Dr. Graham then studied for twelve months in London, at St. Bartholomew's Hospital, and afterwards commenced practice in Glasgow. In 1812 he was appointed physician to the Infirmary of that city and lecturer on Clinical Medicine, and published an essay on the continued fever, which at that time was epidemic in Glasgow. Dr. Graham succeeded Dr. Brown as lecturer on Botany; and in the following year, having been appointed by the government Professor of Botany in the University of Glasgow, he succeeded, in conjunction with some other gentlemen, in getting a Botanical Garden established, and took the principal share in its formation. Dr. Graham married the youngest daughter of David Carrick Buchanan, Esq., of Drumpellier and Mount Vernon. On the decease of Dr. Rutherford he was appointed by the Crown Regius Professor of Botany and Keeper of the King's Garden, and by the patrons to the Professorship of Medicine and Botany in the University of Edinburgh. Soon after his appointment, and principally through his exertions, the present Botanical Garden was formed; and with the able assistance of Mr. William M'Nab, all the trees, shrubs, and plants, were removed from the garden at Leith Walk to their present situation. He also prevailed upon the government to increase the annual allowance to the institution (which is still insufficient, and only half the sum which

is given to a more private one in Dublin), and expended considerable sums from his own resources to maintain its efficiency. Dr. Graham's character as a clinical physician and private practitioner, was distinguished by unbending integrity and honour. He succeeded in greatly interesting the students in botanical science, by giving many prizes and making botanical excursions. Dr. Ransford then noticed his plan of conducting the course, gave some anecdotes of his journeys, and alluded to his annual descriptions of new plants flowering in Edinburgh; the great interest he displayed in the welfare of the Botanical Society, of which he was an original member, and thrice President; the history of the formation of the Society, and his contributions to its Transactions; his papers read to the Royal Society on the gamboge plant; and his researches into the nomenclature and botanical sources of the articles of the *Materia Medica*. He was most attentive to the interests of the University, and supported all the measures of reform in medical education carried into effect between the years 1822 and 1836. In 1840 Dr. Graham was elected President of the Royal College of Physicians; he was a member of most of the scientific societies in this city, and President of many of them. From over-taxing his strength during one of his botanical excursions in 1843, he dated the commencement of his last illness. His case was an obscure one. The town council, at his request, appointed Dr. Joseph Hooker to be his assistant. Although in a very weak state, he introduced him to the class on the morning of the 5th of May, 1845. This was the last occasion on which he visited the gardens. Dr. Ransford then gave anecdotes of his generosity, and resignation during his illness. He was removed to Coldoch, in Perthshire, on the 24th of July, and expired on the 7th of August. The disease was ascertained to be a malignant tumour resting on the dorsal vertebræ, and pressing upon the thoracic duct, vessels, and nerves. He was buried on the 13th in the private burying-ground of Leckie, belonging to his brother Charles A. Moir, Esq. Dr. Graham's whole life was distinguished by uprightness of conduct, cheerfulness of disposition, combined with real kindheartedness. He was very energetic and industrious, most conscientious in the discharge of every duty, and beloved by all who were acquainted with him.

2. Notice of the Vegetation in the neighbourhood of Lisbon, in a letter to Dr. Neill from W. C. Trevelyan, Esq. In this letter, which is dated the 11th of March, Mr. Trevelyan writes — "It was a delightful change of climate we made in six days' sail from Britain, landing on a quay here, with a border in which bananas were flourish-

ing, with lofty bushes of heliotrope covered with blossoms, and geraniums in full flower; an avenue of young *Phytolacca dioica*, and other symptoms of a warm climate. The first crop of peas we find is over, beans are now in perfection, strawberries in fruit, sweet roses in blossom. The wild plants are coming forward rapidly, the limestone hills are covered with the beautiful *Iris sisyrinchium* and *sambucina*, though the latter is not so abundant; *Ophrys vespifera* or *lutea* and arachnites, *Orchis Morio*, several *Antirrhinums*, *Cistuses*, the delicate *Ulex australis*, several *Rutas*, *Cerinthe aspera*, or a variety with purple blossoms striped with white (that I got in Italy and Greece was tinged with yellow); several species of *Calendula*, *Bellis annua*, *sylvestris* and *perennis*, the last the least common, the beautiful *Narcissus Bulbocodium*, *Ornithogalum umbellatum*, *Vinca major*, in great profusion and beauty; *Cynoglossa*, *Lupinus*, *Illecebrum*, *Paronychia*, *Arum arisarum* and *maculatum* (or one which comes very near it), *Aristolochia longa*, *Asphodelus ramosus* and *fistulosus*, *Oxalis tuberosus* and *corniculatus*, *Genista triacanthos*, *Anemone ranunculoides*, and many other plants are now in perfection, as is the delicate annual fern, *Gymnogramma leptophylla*. In the hedges, *Rubus fruticosus*, *Smilax nigra* and *aspera* are abundant, the two latter in fruit. *Ficaria ranunculoides* is very large. *Urtica membranacea* and *urens*, both abundant. I have not observed any other species of this genus. One of the most showy plants in the gardens at present is *Antholyza æthiopica*, which grows in large beds in damp, shady situations. *Calla æthiopica* is also in great abundance, and very fine. Palms, bamboos, *Dracæna Draco*, and other tropical plants, also flourish in the open air."

In a subsequent letter to Dr. Neill, Mr. Trevelyan gives a full list of the plants in flower on 28th of March. In this letter Mr. Trevelyan writes — "The *Cynomorium coccineum*, formerly known in medicine under the name of *Fungus melitensis*, is a very common plant, very showy, and in great abundance on the roots of the shrubby *Cistus*. I hear that a company has been formed in Spain for the cultivation of the sugar-cane. Many things might be cultivated, were it not for the indolence and unenterprising nature of the people. No railroad has been commenced nor determined on, and scarcely any improvements are going on in the country."

Dr. Balfour read a letter which he had received from Dr. Cleghorn, a Fellow of the Society, dated Teerthully, 27th March, in which he states that since the end of October he had made a tour through the north-western division of Mysore, and collected a great number of in-

interesting plants, especially in the western Ghats. Coloured drawings of most of them had been executed by a native (Mahratta) draughtsman who accompanied him. Specimens of many of the plants he purposes to send to the herbarium of the University of Edinburgh, under the charge of the Botanical Society.

Dr. Balfour also read a letter from Dr. H. Giraud, also an active member of the Society, dated Bombay, 26th February. In this letter Dr. Giraud gave an account of the Horticultural Society's Garden at Bombay, of which he is Secretary, and alluded generally to the nature of the vegetation in the neighbourhood. He also noticed the mode of instruction adopted in the Medical College at Bombay, in which he lectures on Chemistry, Materia Medica and Botany.—*W. W. E.*

BOTANICAL SOCIETY OF LONDON.

June 5th, 1846. — Edward Doubleday, Esq., V. P., F.L.S., in the chair.

Dr. Dewar presented a specimen of *Luzula nivea*, discovered near Broomhall, Fifeshire. Dr. D. considers this plant undoubtedly wild in that locality.

The following specimens were exhibited:—

Specimens of *Ranunculus aquatilis* approaching very near to *Ranunculus Lenormandi*, but differing by their more completely tripartite leaves, and the more lateral position of the style on the grown fruit. Sent by Mr. Hewett Watson, from Esher Common, Surrey.

Specimens of a *Filago*, which would be referred to *Filago germanica* by English botanists, but which is thought likely to prove a distinct species by its discoverer, the Rev. G. E. Smith, who communicated the following descriptive account of the plant, along with the specimens for the Society's herbarium.

"*Filago (apiculata*: provisional name). Sandy borders of fields, hedge-banks and road-sides, Cantley, Rossington, &c., near Doncaster.

"Stem *flexuose*, copiously downy, more or less erect. Leaves alternate, scattered upon the stem and branches, sessile, *spathulate*, or *spathulate-cordate*, or *cordate-oblong*, or, beneath the heads of flowers, *obsoletely hastate*, *all apiculate*; smoother above, *pale green*, *with the odour of the tansey*. Heads of few flowers, *ten to twenty*,

very woolly, globose, *scattered on the branches*, and terminal, as well as axillary. Flowers pentagonal, conoidal upwards. Scales of flowers swelled and convex below the point, spinous point smooth, *purple*, strong. Seeds *with few elevations on the evanescent epidermis*, oval.

"Stouter than *F. germanica*, which is gray, not green, and has the heads of thirty to forty flowers, and all (?) terminal to their common stalk. The leaves of the latter are taper to the point, narrower: the involucreal leaves with a broad base, and long, taper point. Our plant flowers later than *F. germanica*, and is rarely observed in the *midst* of fields, where *F. germanica* abounds. The scent of the latter is very feeble: the spinous points of the flower-scales yellow, or very rarely, orpiment. The leaves of our plant are smoother above, and rather woolly, than silvery with short down, as those of *F. germanica* are. I have not met with our plant on clay land, upon which the other often too much abounds. Seedling plants of both preserve the character of the foliage, &c."

GERARD SMITH."

Remarks on Equisetum variegatum, &c.

By D. MOORE, Esq., A.L.S., &c.

IN the number of the 'Phytologist' for the present month (Phytol. ii. 553), I observe a note on *Equisetum variegatum*, *Weber* and *Mohr*, where it is stated that I "still continue to regard that plant as distinct from the prostrate form called *E. arenarium*," the plant figured in 'English Botany' under the name of *E. variegatum*. That such is the case I admit, and farther, I have no longer any hesitation in asserting that our Dublin canal plant is identical with the Killarney plant, *E. Wilsoni*, *Newman*. At page 40 of the 'British Ferns,' you say you "cannot concur in this opinion without additional evidence in its support," which I shall now endeavour to afford. It is this: in March, 1845, I wrote to a friend residing at Killarney, requesting he would search the shores of the Lake near Muckruss, for the *Equisetum* Mr. Wilson had previously discovered there, at the same time affording him all the detail I thought likely to assist him in finding it. In the course of a fortnight afterwards, I was gratified on receiving a letter from him, inclosing specimens of the plant, with a description of the locality where he found it, which perfectly agreed with that

given by Mr. Wilson. I immediately wrote back to my friend, and begged he would at once send me some good plants to cultivate, which he kindly did, and on receiving them I had no difficulty in identifying them with the canal plant. To prove this, as well as to afford others an opportunity of judging for themselves, I had plants from both localities planted together, where they have now been growing upwards of one year, and they continue to bear as much general resemblance to each other as any two things of the same kind in nature can well do, but you know there are those who go so far as to affirm that no two eggs laid by the same fowl are *exactly* alike. *E. Mackaii* and *E. arenarium* are also growing along with them, each species, or *permanent* variety, whichever you will, retaining its respective characters without the slightest appearance of altering. In Ireland I have not yet seen intermediate states of either collected by any botanist, but the English specimens of *E. arenarium* from sand-hills at the mouth of the Mersey, appear rather different from the Portmarnock plant, inasmuch as they are considerably larger in all their parts. The Scotch plant from the Sands of Barry is identical with the Portmarnock one.

The distinguishing characters which mark the hyemale section of British *Equiseta* have been so ably detailed in the second edition of the 'British Ferns,' that I have nothing new to add to support the opinion of the plants in question being permanently distinct forms of the genus. I may, however, be permitted to ask the natural conclusion likely to be arrived at, when we thus find that they occur in localities widely apart, precisely under similar circumstances, retaining all their respective characters, and that they remain unaltered when submitted to the test of cultivation. Surely we cannot think them accidental varieties, nor permanent *local* varieties, because neither changes of soil or situation essentially affect them. The only remaining test, then, to prove them to be what we are in the habit of regarding as species, is, to try whether their reproductive organs will perpetuate the same forms without any sensible degree of change; and this, I venture to conjecture, will be the case when fairly tested. I have no wish, as you observe, that any new name should be added. I am perfectly satisfied now that they are clearly defined, and have no doubt of the correctness of your views in referring the semi-aquatic plant to the true *E. variegatum* of Weber and Mohr. *E. arenarium* is probably the best name we could have to distinguish the

'English Botany' plant by, and one which in all fairness may be employed, at least until the synonymes of early authors respecting the plant be better unravelled.

D. MOORE.

Glasnevin, Dublin, June, 1846.

On the occurrence of Pyrola rotundifolia, Alchemilla alpina and Viola lutea, var. γ. on the Sidlaw Hills, Forfarshire. By GEO. LAWSON, Esq.

PRESUMING the following stations to be new, I transmit these notes for the 'Phytologist.'

Pyrola rotundifolia.—In July last year, while on a ramble in company with my friend, Mr. James Adie, I had the pleasure of finding a solitary specimen of this rare and lovely floral gem near the summit, on the south side of the white hill of Auchter-house (one of the Sidlaws), growing among some small larch trees. We culled the specimen, leaving the root; but as a very heavy rain fell at the time, and we had previously had a good soaking during the ramble, we did not continue long to search for other specimens. It would appear that this plant is frequently confounded with the *P. media* and *P. minor*. I am, however, quite sure that the plant I found was the true *P. rotundifolia*. *P. minor* grows very abundantly in the woods in this quarter.

Alchemilla alpina.—A small patch of this interesting alpine plant grows in a sheltered hollow on the top of a low hill among the Sidlaws, where I first found it during the summer of 1844. It appears to be indigenous, maintaining its situation amongst close-growing heather and matted *Trichostomum lanuginosum*.

Viola lutea, var. γ.—A few days ago I observed on the top of the white hill what appears to me to be the variety *γ.* of *Viola lutea*, found by Mr. S. Murray on the Isle of Arran. It is distinguished by its broadly ovate, subcoriaceous leaves and deep yellow flowers.

GEO. LAWSON.

108, Hawkhill, Dundee,
15th June, 1846.

On a monstrosity of Cardamine pratensis. By GEO. LAWSON, Esq.

A FEW days ago, by the margin of a peat-bog at the Sidlaw hills, in Forfarshire, I found an instance of abnormal development in the *Cardamine pratensis*, somewhat similar to that written of by Dr. Bromfield, at page 241 of the present volume of the 'Phytologist.' Several of the seed-pods on the lower part of the corymb were changed from their usual linear to a subulate form, and on opening them, I found a little below the middle of the pod, a mass of petaloid laminæ, completely filling that part of it; and above these a number of ovules, arranged in the ordinary manner along either side of the vessel. On the upper part of the corymb was a flower, with petals having a foliaceous appearance, but on the margins having a true petaloid character: that flower had, before opening, been enclosed in an ovate-elliptical seed-vessel, such as those mentioned by Dr. B., but the petals &c. "had burst from their confinement at the commissures, * * * the valves of the pod answering exactly by their position to the true calyx." It was furnished with the proper number of anthers (six), but two of these were placed on one filament: the filaments of the stamina were much swollen, as indeed were all the other parts of this monstrous combination of blossom and seed-vessel. It also contained a germen of about half an inch in length, of a tapering form, being thickest at the basal extremity: this germen was hollow, but I could detect no ovules in it. The other flowers of the corymb were in all respects of the normal form. I observed several minute caterpillars of a bright scarlet colour on the inside of the petals of this latter flower: might these be the cause of the deformity? Insects are often found to give curious forms to leaves and flowers. Sir William Jackson Hooker, in speaking of this plant, remarks,— "Sometimes found double, in which state the leaflets are known to produce new plants, when they come in contact with the ground, while still attached to the parent plant," (Brit. Flora, ed. 5. i. 25). Is the state here referred to that spoken of by Dr. Bromfield?

GEO. LAWSON.

108, Hawkhill, Dundee, June 15, 1846.

Note on Arenaria uliginosa (Alsine stricta). By J. BACKHOUSE, JUN.

It may not be uninteresting to some of the readers of the 'Phytologist' to know that in the early part of last month, in company with G. S. Gibson, Jas. H. Tuke (of York), and my father, I found several plants of *Arenaria uliginosa (Alsine stricta)* in the old locality on

Widdy-bank Fell, Teesdale. It was not in flower, and we saw no trace of it until we had reached the exact spot where we previously found it. *Equisetum umbrosum* was abundant on the Yorkshire side of the Tees, near Winch Bridge. JAS. BACKHOUSE, JUN.

York, 19th of 6th month, 1846.

Death of Mr. Thomas Edmondston.

TWELVE months ago we mentioned Mr. Edmondston's appointment to the *Harold*, as botanist to the expedition for exploring the north-west coast of America; it is now our duty to record his decease under the melancholy circumstances stated in the following extract from the *Morning Chronicle* of June the 11th, 1846. Letters written by Mr. Edmondston, when full of health and spirits, were received in England by several of his friends almost simultaneously with the appearance of the paragraph in the *Chronicle*.

"Melancholy Accident on Board H.M.S. Harold, in the Pacific. Letters from some of the officers of that ship, and her tender the *Pandora*, have been received, dated April 24, 1846. The *Harold*, Capt. Kellet, had been to the Galapagos, and returned to the coast on the 22nd of February. While off the mouth of the small river Sua, about five miles from Atacamez, an accident occurred which has deprived the expedition of one of its most valuable officers, just at the period when his services were beginning to be required. A party had been employed on shore, and on returning to the boats a loaded rifle happened to be touched by one of them when jumping into a boat, wading through the surf—it went off, and the ball first struck the arm of the clerk, slightly wounding him, and then passed through the head of Mr. Edmondston, the botanist of the expedition, killing him on the spot. His death was instantaneous. The loss will be greatly felt, as Mr. Edmondston was an exceedingly amiable and talented young man, deservedly regarded by his messmates and all on board the *Harold*; and although but twenty-three years of age, had greatly distinguished himself in his profession. He had lately been elected botanical professor of the Andersonian University of Glasgow; he was also the author of a botanical work, the *'Flora of Shetland.'* His remains were buried on shore on the following day, with funeral honors, and attended by the greater part of the officers of the expedition. The *Harold* and *Pandora* had commenced their surveys of the coast of California, and were occupied in March last in the Bay of Choco."

Notice of the Botany of Mildenhall. By J. TOWNSEND, Esq.

As the 'Phytologist' expressly states one of its objects in view, to be the notice of localities of rare and remarkable plants, I have drawn up a short list of those observed about the neighbourhood of Mildenhall, on the eastern borders of Suffolk, during two days botanizing at that place, in the beginning of the present month. The list must necessarily be imperfect, being the result of only two days observation, and this, too, chiefly confined to those plants *peculiar* to this neighbourhood and other parts of Suffolk.

The Flora of this part of Suffolk appears so peculiar and remarkable as to deserve a short description. Immediately on leaving the town I was struck with the peculiar appearance of vegetation; the subsoil is chalk, covered over by vast quantities of sand and gravel, which give the character to the neighbourhood. On the high land the chalk is frequently seen at the surface. In many fields, sand forms the only soil, and scarcely a stone or rolled pebble is to be met with; it may easily be imagined that many plants would find but poor sustenance on so dry and unstable a foundation, and such is found to be the case, for many of even our common plants are rarely, if at all, to be met with. In such places the farmer need bestow little labour in weeding, for there are no weeds to be seen; and the corn is dried up and withered, or has never struggled to the surface.

A great part of the land is totally uncultivated, and the barren heaths are ploughed only by the rabbits, who here find a suitable dwelling-place, but not unmolested, as persons are employed solely in destroying them. There are many chalk and gravel-pits on these heaths. The open woods consist principally of fir, and produce little else but nettles, stonecrop and chervil (*Anthriscus vulgaris*), which last is one of the most frequent weeds, both in the woods and on the heaths, encircling the rabbit-burrows with its welcome shade, and climbing the sides and tops of the mud walls in luxuriant profusion.

But what struck me particularly was the occurrence of *Phleum arenarium*, fine plants of which are met with at every step, and *Carex arenaria*, which creeps along the dry heath, binding firmly the loose sand and gravel; these plants I had only known as natives of the sea-shore, and on first beholding them I almost listened for the roaring of the waves, and sought the cool sea-breeze to protect me from the piercing rays of the hottest noon-day sun. I should much wish to know if these two last-named plants are to be met with *constantly* between this and the sea-shore of Suffolk. I should imagine such

would be case, and geologically considered, it would offer an interesting problem with regard to geographical distribution.

I never before noticed so clearly the creeping character of *C. arenaria*: along the even ground are seen long streaks of green continuing in a straight line for four yards or more, the rhizoma creeping on-wards and throwing up its numerous shoots along the whole length.

In the corn-fields immediately around Mildenhall I found sparingly *Veronica triphyllos*, though every plant was so burnt up as to crumble in the hand; and on the heath, under the shade of the furze, *Veronica verna*, also withered, and in this state difficult to distinguish from dwarf specimens of *V. arvensis*, whose habit it closely resembles. It must be understood I am speaking of the north, east and south sides of Mildenhall, occupying a space of about three miles as a radius, and as yet principally of the low land.

There still exists here and there in patches, some bog land and fen, although at a former period there must have been much more, particularly near the river. Beneath the village of Eriswell, east of Mildenhall, there is some good fen land and sandy bogs: in these I sought earnestly for *Sturmia Loeselii*, but without success; those plants that I met with will be found in the list below.

On the high land *principally*, I gathered *Silene Otites* and *conica*, *Phleum Bœhmeri*, *Artemisia campestris*, *Scleranthus perennis*, with others. I had no time to search the ponds and ditches.

I have already swelled these notes to a greater extent than I had intended, and will now give the list of plants worthy of notice; but I hope the above remarks may not prove without interest, independent of the verification of localities of the rarer plants.

Thalictrum minus. Sparingly.

Papaver Argemone.

Fumaria Vaillantii.

Teesdalia nudicaulis.

Arabis hirsuta.

Sisymbrium Sophia.

———— *thalianum*.

Erysimum cheiranthoides.

Sinapis alba.

Reseda luteola.

———— *lutea*.

Silene Otites. Common.

———— *conica*. Rare; waste, sandy fields.

Stellaria glauca.

- Cerastium arvense.*
Alsine tenuifolia. Common.
Medicago minima.
Trifolium scabrum.
Astragalus hypoglottis.
Onobrychis sativa.
Vicia lathyroides.
Comarum palustre.
Rosa rubiginosa.
Scleranthus perennis. Principally on the high land.
Sedum acre.
Saxifraga granulata.
Hydrocotyle vulgaris.
Sium latifolium.
Oenanthe Phellandrium.
Anthriscus vulgaris. Every where.
Arnoseris pusilla.
Onopordum Acanthium.
Artemisia campestris.
Filago minima.
 ——— *germanica.*
Erigeron acre.
Echium vulgare.
Cynoglossum officinale.
Hyoscyamus niger.
Linaria vulgaris.
Veronica scutellata.
 ——— *verna.* Heaths.
 ——— *triphyllos.* Sandy corn-fields.
Calamintha Acinos.
Galeopsis Ladanum.
Pinguicula vulgaris.
Hottonia palustris.
Anagallis tenella.
Hydrocharis Morsus-Ranæ.
Cladium Mariscus.
Schænus nigricans.
Scirpus pauciflorus.
Carex dioica.
 ——— *intermedia.*
 ——— *arenaria.*

Carex muricata.

—— *teretiuscula.*

—— *paniculata.*

—— *binervis.*

—— *ampullacea.*

Phleum arenarium. Every where.

—— *Bœhmeri.* Chalk-pits and heaths south of Eriswell.

Koeleria cristata. Very abundant.

Avena pratensis.

Glyceria plicata.

Bromus erectus.

Festuca bromoides.

J. TOWNSEND.

June, 1846.

Notice of the 'London Journal of Botany,' No 55, dated July, 1846.

(Continued from page, 550.)

The contents are: "Botanical Information." "Enumeration of plants collected by Sir Robert Schomburgk, in British Guiana;" by George Bentham, Esq. "New Hepaticæ;" by Thomas Taylor, M.D.

The first seven leaves are devoted to the "Botanical Information," which comprises miscellaneous notes on South Africa, by M. Zeyher; with some "Notes on the Botany of the Pyrenees," by Mr. Spruce. As the Robertsonian Saxifrages have lately excited some attention, in consequence of Mr. C. C. Babington's rather hasty statements respecting imaginary differences between those of Ireland and the Pyrenees, it may be interesting to the readers of the 'Phytologist,' to learn that Mr. Spruce finds those of the Pyrenees running through the same changes which had been so completely established by Mr. Andrews, in reference to the Irish plants. It always appeared very strange that Mr. Babington should have visited the localities of the Irish Saxifrages, and yet there found nothing in exception to the descriptions which he put forth, while Mr. Andrews should find and distribute such ample proofs of their inaccuracy. It is more easy to understand the errors with respect to the Pyrenean examples, perhaps few in number, and examined only in herbaria. The case shows how careful scientific men ought to be in making and circulating positive

statements on merely negative evidence. To assume and assert that things do not exist, simply because they have not been detected by a certain individual, is a rash proceeding, where everything else renders their existence probable. It is high time that the *Annals*, which gave such prominence, and its circulation to the error, should correct the false evidence which was inadvertently spread thereby. On these *Saxifrages*, Mr. Spruce writes thus :

"I must not omit to state that I gathered *Saxifraga umbrosa*, *hirsuta* and *Geum* growing together, and I wish I could say, not passing into each other. I feel satisfied, however, that if we will have two species, we must, to be consistent, admit three, the three above named, which are admirably though briefly characterised in the second edition of Koch's *Synopsis*. I have seen few *Saxifragæ* in the Pyrenees, which might not safely be referred to one or the other of these, yet there are some which appear exactly intermediate between *S. umbrosa* and *S. hirsuta* ; for example, I have observed a state possessing an expanded and cuneate petiole as in the former, and yet hairy on the entire upper surface ; and another with leaves oblong-rotundate, tapering suddenly into the petiole (as in *S. hirsuta*) and yet the latter merely ciliate at the margins.

As to the cuttings of the edges of the leaves, all the three vary from crenate to inciso-serrate. (See *Phytol.* ii, 380 and 381, for the facts and references in the discussion about the *Saxifrages* of Ireland.)

The rest of the No. is occupied with Mr. Bentham's descriptions of South American plants, and Dr. Taylor's account of the new *Jungermannias*, from various distant lands. C.

Notice of the 'Annals and Magazine of Natural History,' Nos. 113, 114, 115, & 116, dated May, June, and July, 1846.

(Continued from page 508.)

No. 113. Contents: "Notes on the altitudinal Range of the Mosses in Aberdeenshire;" by George Dickie, M.D. &c. "A Synopsis of the British Rubi;" by Charles C. Babington, M.A. (continued and concluded from former Nos.) "On the development of *Chara*;" by C. Muller, (translated from the *Botanische Zeitung*). "Mode of formation of the Spore in a species of *Vesiculifera*;" by G. H. K. Thwaites, Esq., "Botanical Notices from Spain," by Moritz Willkomm, (translated from the *Botanische Zeitung*). "Bibliographical Notices of the '*Flora Calpensis*' and 'Outlines of Structural and Phy-

siological Botany.' " Proceedings of the Linnean Society, and of the Botanical Society of Edinburgh. "The Potato Fungus," by M. J. B. in 'Gardener's Chronicle.'

For the most part the Botanical contents of No. 113, are useful or valuable contributions to science, creditable to their contributors or to editorial selection. But they are not such as present passages adapted for separate perusal, as illustrative extracts. From this general approval we must make an exception of some parts of the notice of the 'Flora Calpensis;' the reviewer having unfortunately selected for his commendation, and for extract, just those particular matters in the work reviewed, which are most imperfect and untrustworthy: we refer to the habitats of the species in other parts of the world, and the numerical summaries founded thereon. Whatever opinion we may form of the 'Flora Calpensis' in other respects, we may confidently say that the holding up of such exceedingly imperfect notices, as "a very valuable addition to the list of species, showing at a glance the countries in which each plant has been observed," is a serious mistake on the part of the reviewer. We do not suppose that the author intended them to be so received; for he expressly qualifies the numerical results, by saying "as far as the extent of my inquiry has enabled me to judge;" and this qualification was really very necessary. But when these same results are blindly copied by a reviewer, who omits the requisite qualification, and substitutes a high eulogy in place thereof, they can only mislead and confuse, instead of yielding suggestive ideas, confessedly requiring more research.

The importance of the subject may justify a reprint of the few lines, on 'the potato fungus.' "Mr. Moore of Glasnevin, has sent me this morning a leaf of a potato clothed with our old enemy, *Botrytis infestans*, from potatoes in the Royal Botanic Garden, Dublin. Everything seems to tend to a repetition of the ravages of last year. I can persuade nobody here that there are any [reason for] fears, and all advice is vain." The existence of some plants infested with the *Botrytis infestans*, really does not appear any strong reason for fears, so long as it does not spread largely, as was the case last year. At the date of writing these remarks, we have been using this year's potatoes from the open garden, full three weeks, and not a single diseased tuber has been found among those dug up: on the contrary, they are found to be remarkably healthy and good, in the ground to which we allude, on the south side of London. But should continued cold and wet weather follow the dry heat of June, as was the case last year, we may then be too successful in persuading people to fear.

No. 114. Contents: "On the development of Chara;" by C. Muller, (continued). "Notes on the Botany of Scinde;" by J. E. Stocks, M.D. "Botanical Notices, from Spain;" by Moritz Willkomm, (continued). "Bibliographical Notices," of Harvey's 'Phycologia Britannica.' "Miscellaneous,"—"Does Magnetism influence the circulation in Chara?"

The "Botany of Scinde" is an attractive title; but the contents of the short letter on that subject, yield very little information. The writer enumerates *Tamarix gallica* and *Rumex acutus*, as found there; but we must say that a sight of the specimens would be more satisfactory than their names in the letter of a botanist, who seems somewhat young in the study. The reply to the query, on the faith of Dutrochet's experiments is, that magnetism does not influence the circulation in Chara, and that "there is no relation between the magnetic force and the vital force producing this circulation." This conclusion, however, is much more comprehensive than the experiments would seem reasonably to justify.

No. 115, the 'Supplementary Number,' for the first half-year of 1846. Contents: "Botanical Excursion in Lower Styria, in 1842;" by R. C. Alexander, M.D. "Journey through Java, descriptive of its topography and Natural History;" by Dr. F. Junghuhn (a translation, continued from a former No.)

Though these two papers may be held good of their class, they belong to a class or style of writing which is seldom of any value in science. Only a botanist who is already well acquainted with plants, and their distribution in the neighbouring countries, can be prepared to select for record, those facts which are most important to the progress of science. In the absence of this previous preparation, he must notice and tell what he saw at random, often passing by the new and important, to dwell upon the trivial and familiar. Dr. Alexander enjoyed the advantage of an excellent knowledge of European plants; having studied them in various countries, in a state of nature, and also as dried specimens in the library and museum. He knew when he detected any species which was a novelty to the recorded Flora of Styria; and conversant with the differences of identical species, under changed conditions of soil and climate, he keeps clear from the common error of merely local botanists, in mistaking each trifling variation of character for marks of a new species. Of late, it has been attempted to conform our lists of British plants, to the contracted views of certain Swedish and German botanists; acute observers of trifling differences, among the plants of narrow area. Dr.

Alexander specifies some instances of spurious species which are recognized or invented by botanists of that school ; and as the evil is spreading into England, it may not be out of place to quote a passage or two, in relation to this subject.

"With regard to the *Erysimum*, I may say as I did of the *Potentillas* and *Primulas*, that there is no drawing an exact line between the different forms in the genus. *E. carniolicum*, *odoratum*, *strictum*, *repandum*, *crepidifolium*, change their names with every herbarium one looks into." . . . "The fact is, that all five are one and the same species. Books are usually written by chamber botanists, who receive only the extreme forms, characteristic specimens, and hence arises this multiplicity of species."

Again, "Bohemian botanists, Tausch and Co., who live in a country where there is very little variety of climate and situation, seem incapable of conceiving the versatility of plants in accommodating themselves to circumstances. A more remarkable instance of this quality is seen in the *Moehringia*, which on hot, dry limestone rocks is *M. Ponæ*, and in the crevices and under the shadow of bushes *M. muscosa*. In ravines which are constantly damp and shady I have remarked the same transition of *M. trinervia* into *M. heterophylla*. A very careful and excellent botanist, Mr. Zehentner, has collected transition forms with as much care as others throw them away ; among *Arenarias*, *Campanulas*, *Primulas* and other genera, he has shown that great number of so-called species are only varieties."

We heartily wish that a number of English botanists, would set to work to collect varieties and intermediates. The accumulation and preservation of such physical evidences, is the best antidote to the vanity of species-making, and to the less excuseable dishonesty in science, which sometimes prompts authors and editors, to suppress facts of this kind, when they happen to conflict with the opinions which they have themselves too hastily printed.

No. 116. Contents: "On the circulation of the Sap in the Interior of Cells;" by Hugo von Mohl, (translated from the *Botanische Zeitung*.) "Observations on the Cell-Membrane of Plants;" by G. H. K. Thwaites. "Botanical Society of Edinburgh."

Occurrence of a new Variety of Silene inflata in Fifeshire.

By GEORGE LAWSON, Esq.,

ON the flowery banks of the river Eden, at the delightful spot called Eden-grove, where, under the cooling shade of the waving trees, and round a lovely luxuriance of *Geranium pratense*, *Iris pseud-acorus*, *Valeriana officinalis*, and other floral beauties, may frequently be seen the wary angler, eyeing the lively trout as it nibbles his bait, I find a variety of the *Silene inflata*, with the stem, and leaves (on both sides) covered with a rough pubescence, while the peduncle and calyx are perfectly glabrous. I presume this variety to be intermediate betwixt the normal form and the variety β , which has been found "near Cromer, Norfolk" and "Banks of the Clyde." The normal form is always wholly glabrous, while the var. β . has the "calyx, stem and leaves downy." This variety, which I believe to be a new one (not having observed it previously noticed), generally grows very luxuriantly here; much more so than the normal form: indeed I have not seen instances of pubescence in plants of *S. inflata*, of the ordinary size. It may be worthy of remark that I have not been able to discover different degrees of pubescence, or anything approaching to an "almost glabrous state."

GEO. LAWSON.

Dron, by Cupar, Fifeshire, July, 1846.

P. S. I think this variety may be common although hitherto overlooked, and am almost certain that I have seen it by the road-side to the westward of Dundee in Forfarshire, while residing there, although I then passed it by without notice. May I ask local botanists, (and I am glad to observe these are on the increase), to look out for the plant at that place, as I may not have occasion to pass that way soon.

G. L.

Supposed transformation of Oats into Rye.

By JOSEPH SIDEBOTHAM, Esq.,

THE well known statement of Dr. Weissenborn, and others, of a plan for the transformation of Oats into Rye, must be familiar to every reader of the 'Phytologist,' but perhaps few have thought it worth the trouble, either to verify or contradict it. Having seen the statement often repeated, like advertisements of quack medicines, and recommending "*only one trial*" to be convinced of its truth, I determined to try the experiment.

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The oats ought to be sown in June, but it was not till August that I sowed a small plot, having previously examined the seed, to see that no rye was mixed with it.

The grain soon sprung up, and to follow Dr. Weissenborn's direction, I cut it down twice before Christmas, and thinking that by cutting it again, I might convert it into barley, or perchance Indian corn, I cut about half of the crop again in February, and again a portion in March.

Being rather impatient to see the result, a few days ago I gathered stems of each of the series, and slit them up, to see how far the rye was developed. In the one cut twice, the panicle was fully formed, and just ready to burst from its sheath, but it was *nothing like rye and very much like oats*. I next tried those cut three times, with the same success, only the panicle was not so fully developed, and much lower in the sheath. In those cut four times, the panicle was very young indeed, only just distinguishable, but it would have required *a considerable* stretch of imagination to think that it would ever become rye: should any of it do so, I shall not neglect to inform your readers.

Should any of your readers have been more fortunate in the transmutation, perhaps they will oblige us with a detail of their experiments.

JOSEPH SIDEBOTHAM.

Manchester, June 11th, 1846.

[Dr. Weissenborn would perhaps attribute the apparent *failure* of the above experiment to his instructions not having been followed to the letter: since, in order to insure success, he insists on the *absolute necessity* of the oats being sown about the end of June: he certainly says nothing about their being sown *later* than that time; but in all experiments, undertaken with the object of verifying the statements of previous observers, their own directions should be scrupulously followed.—ED.]

Extract of a letter from the late Mr. Edmondston to Mr. Sidebotham.

I RECEIVED a letter a few days ago from Mr. Edmondston, and as some of the readers of the 'Phytologist' may feel interested, I send you an extract from it. The letter is dated "H. M. S. Harold, on passage from Valparaiso to Callao, December, 8th, 1845," and was

addressed via "Panama." After various remarks not of general interest, he says, "The ship to which I am attached is a frigate, of 26 guns, and we are accompanied by the Pandora, a brigantine of 320 tons, as tender. Our destination is to survey the coasts of Central America, California and the N. W. coast, including the Columbia river, north to Nootka, this will take about five years. I suppose we shall return by India, and the Cape of Good Hope; we stayed a day at Teneriffe, where I made an excursion, but the season was unfavourable for plants: some scarce British species were abundant, as *Polypogon Monspelienensis*, *Bromus maximus*, *Centaurea solstitialis*, &c. Our next resting place was Rio de Janeiro: here we staid twelve days, and I made a good collection of the magnificent plants and insects of that splendid country. We now steered our course to the Falkland islands: there we staid twelve days also, but the weather was so rigorous, storms and snow, that little could be done. Some plants the most interesting of which is the *Tussack grass*, were procured, the Lichens are very fine, especially the *Strictæ*; but owing to the season few *Phanerogamia* were in perfection. After a very tedious and gloomy passage we reached Valparaiso on the 16th of last month: I immediately hired horses and started for the interior; here I spent a week most delightfully, botanizing among the mountains. The climate of Chili is delightful, very dry, and in consequence scarcely any *Cryptogamia*, and few insects, but the Flora is most beautiful; the most abundant genera are *Epilobium*, *Oenothera*, *Calceolaria*, *Fuchsia*, *Cynarum*, *Gentiana*, *Convolvulus*, *Mesembryanthemum*, *Papaver*, *Lilium*, *Hesperis*, *Oxalis*, *Lobelia*, and hosts of *Compositæ*. I made a very large collection, and enjoyed myself extremely. We left Valparaiso on the 4th inst., and are now on our way to Callao where we shall stay a few days, thence proceed to the Gallapagos Archipelago, and thence up the coast towards Panama. Our route hitherto has been such, that except a few at the Falkland islands, I have got no mosses: as we get north, we shall have lots of opportunities for getting them. I have by no means lost any of my old relish for these 'atoms of creation,' and I trust when I see old England again (if God spare me) to give you some fine ones from the Rocky mountains."

The above is the principal part of the letter which will be of interest to your readers.

JOSEPH SIDEBOTHAM.

Occurrence of Lepidium Draba, near the Croydon Railway.

By WILLIAM ILOTT, Esq.

I DISCOVERED the other day, a profusion of *Lepidium Draba*, near the Croydon railway, about a mile from the Dartmouth Arms: the spot may either be found by keeping the sides of the remaining portions of the old Croydon canal, till you come to a house near the end of the canal, in the occupation of Mr. Cutbush, or by leaving the road over Forest-hill from Peckham Rye, and taking a foot path, which leads direct to the said house of Mr. Cutbush. Abundance of the plant will be found among the rubbish, near the first bridge over the Croydon railway. As there appear hitherto to have been only three known stations for the above plant, the knowledge of a new station will probably be interesting to our metropolitan botanists, as it is so easily accessible. I have procured abundant specimens, for those who may apply for them.

WILLIAM ILOTT.

Bromley, Kent,
June 6th, 1846.

On the occurrence of the White-flowered Variety of Orchis latifolia in Glen Isla. By W. OGILVIE, Esq.

A FEW days ago, a friend who had been on a ramble (though not strictly speaking a botanical one) in the Highlands, handed me a few specimens of the white-flowered variety of *Orchis latifolia*, gathered by him in Glen Isla. The variety is I believe one of rare occurrence, only one locality being recorded for it in Hooker's Flora, viz., Sands of Barry, where however, I never had the pleasure of meeting with it.

WILLIAM OGILVIE.

20, Castle Street, Dundee.
June 19, 1846.

Mode of preserving the Color of Flowers. By F. J. OGDEN, Esq.

THIS spring I have adopted a plan of preserving flowers, which may be new to some of your readers, as it has proved to be to the botanical gentlemen to whom I have showed it here. I will proceed to explain how it is done. You take the flower or leaf and press it for two or three hours, then gum it on the paper, upon which it

is to remain. Afterwards return it to the press to dry. In this way the colors of the flowers are kept. The following are a few of the flowers I have tried successfully.

Snowdrop	Wall-flower	Jonquil
Crocus	Pyrus Japonica	Narcissus
Primrose	Polyanthus	Primula cortusoides
Heart's-ease	Yellow Auricula	

I find this plan to do better than any other I have tried. The flowers preserved in this way are less liable to be lost or injured. The color of the leaves too keeps very well, nor do they shrivel, as as they often do, when pressed loose in a book.

FREDERICK J. OGDEN.

The Oaks, near Manchester.

May 19, 1846.

[It must be borne in mind, that, although the Editor is always willing to publish recommendations of this kind, still he is in no way responsible for them. On a former occasion he incurred great blame for publishing recommendations on this subject, which other correspondents were led to try, and found utterly worthless. He has not the pleasure of a personal acquaintance with Mr. Ogden, but ventures to hope that the recommendation now before him, has not been published without abundant proof of the efficacy of the plan. It is as impossible for the Editor to test the value of such recommendations, as to examine and compare the characters of plants, which may be casually contrasted. Let it therefore be distinctly understood that every contribution is like a separate work: the responsibility is with the author alone.—ED.]

BOTANICAL SOCIETY OF LONDON.

July 3rd, 1846. A. Gerard, Esq., in the chair.

Donations of British plants were announced from Dr. Dewar, the Rev. G. W. Sandys, Mr. Alfred Greenwood, Mr. A. J. Hambrough, the Rev. R. Creswell, Mr. James Lynam, Mrs. F. Russell and Mr. O. A. Moore.

Read "Notice of a variety of *Cnicus arvensis*? found in Fifeshire." By Dr. Dewar.

"Its habit when growing is very different from the *C. arvensis*. The leaves are sinuated rather than pinnatifid, not crisped and curled,

but nearly flat, and sharply spinous, with a decurrence of spines from each leaf. The involucre differs in nothing from the *C. arvensis* and *C. setosus*: the florets are shorter and not so remarkably fragrant as those of *C. setosus*."

A specimen was presented.—*G. E. D.*

Further notice of Lindley's 'Vegetable Kingdom.'

IN a former number (Phytol. ii. 521), we gave a review of this elaborate work, in which we expressed a doubt as to the correctness of the numbers assigned to the aggregate of genera and species. Our observations have induced the author to revise these various statements, and he has sent the following important corrections.

"1st. In the body of the work the number of species of Berberids, is misprinted 10 instead of 100.

"2nd. In the table of genera and species at p. 797, the drawing up of which being a mere mechanical operation, was entrusted to an assistant, there are several small errors. In order 113 the number of genera is 12 instead of 2. In order 213, the number of genera should be 38 instead of 30. In order 273, alliance 50, the number of genera has been cast up wrong: it should be 1102, instead of 1094. In order 286 the number of species is printed 500, instead of 800. But in addition to these minor matters, there are two enormous mistakes in casting up the columns of genera and species of Exogens, which should be 6,191 and 66,225 instead of 18,062 and 55, 911. The total number of genera and species now known, according to the estimates of the 'Vegetable Kingdom' are

Genera 8,935

Species 92,930

"I need not say" continues Prof. Lindley, "that the existence of errors of such magnitude is to me extremely vexatious, but I fear that no one can escape from them who trusts to the accuracy of assistants, in even so small a matter as casting up a few columns of figures. My only consolation is, that they do not occur in the body of the work."

For ourselves we could take no "consolation" at all from any circumstances connected with these truly "enormous" blunders, but should consider it our bounden duty to reprint the sheets in which they occur: the public ought not to suffer for such gross neglect, and we hold the author responsible for the competency of his servants.

Within a year we may have speculators quoting the 'Vegetable Kingdom' in favour of some wild hypothesis, and repeating to the world these ludicrously inaccurate summaries, as a proof that the number of natural genera is rapidly advancing towards that of species.

O. P.

Note on Trichomanes speciosum.

Mr. William Andrews, Secretary to the Dublin Natural History Society, read a paper upon the genera *Trichomanes* and *Hymenophyllum*. His remarks were chiefly directed to the species of *Trichomanes* discovered by him in September, 1842, in the western part of the county of Kerry, and which presented a variety of growth and state of fructification so much more developed and characteristic of the genus of that beautiful fern, than had hitherto been met with in Ireland, that it determined him to examine its affinities with some of the exotic ferns, particularly with those of the West India islands.

The *Trichomanes* was first discovered in Britain, by Dr. Richardson, at Belbank, near Bingley, Yorkshire, a wretched specimen of which is in the Banksian Herbarium, now in the British Museum: a figure of a barren frond is given by Dillenius in Raii Syn. p. 127, t. 3. This specimen, however, not having been found in fructification, was supposed to be identical with the *Filix* (*Trichomanes*) *pyxidifera* of Plumier, and was described as such by Hudson, in his *Flora Anglica*, p. 461: and this name it retained until its discovery, in the month of October, 1804, at Turk Waterfall, near Killarney, by Mr. Mackay curator of the botanic garden at Trinity College. Mr. Mackay obtaining this beautiful fern in fructification, forwarded specimens to Sir James Edward Smith, who at once decided its distinctness from Plumier's plant and considered it to be a new species, which he named and figured in 'English Botany' as *Hymenophyllum alatum*, from its winged stipe. The distinguished Robert Brown, the first physiological botanist of the day, corrected this specific appellation to that of *brevisetum* (Br. in Hort. Kew. ed. 2, 5, p. 529), from the short and barely exerted state of the receptacles that the Killarney plants generally presented. Mr. E. Newman, who has devoted so much attention to the specific characteristics of the British ferns, formed the first view, that the Killarney species perfectly agreed with Willdenow's description (Sp. Plant. v. p. 514) of the *speciosum* of Teneriffe, and published it as such, in his first edition of the 'History of British

Ferns.' The specific name *brevisetum*, however, was still retained through the several editions of the 'British Flora,' until the discovery by Mr. Andrews, in September, 1842, in a wild and wooded glen in the western part of the county of Kerry. The striking characters and fine state of fructification exhibited by these splendid plants, the most rare and most beautiful of British ferns, and now altogether confined to the south-western parts of Ireland, led Mr. Andrews to examine them minutely, and to trace their affinities with the numerous exotic species of that beautiful genus; and from communications with Sir William J. Hooker, and to the great kindness of that most excellent botanist and encourager of science, and the reference to his very extensive fern-herbarium, it was traced and detected to be the true *Trichomanes radicans* of Swartz, setting aside the species *brevisetum* of the 'English Flora,' and the *speciosum* of Willdenow. Thus the mild temperature of the south-western parts of this country produced, in the utmost luxuriance of tropical growth, a plant peculiar to the West India islands, and to the western coast of South America. To Dr. Scouler's kindness Mr. Andrews was also much indebted for specimens of *Trichomanes radicans* and *T. scandens*, collected by Dr. S. in Brazil, and which enabled many doubts to be cleared up.

Mr. Andrews noticed a very remarkable character of fructification in the new variety from Kerry, "that the capsules formed around the base of the receptacles within the cylindrical involucre, and as the receptacles elongated and became exserted considerably beyond the involucre, the capsules continued forming in an even dense mass to the extremity of the receptacles." This is described as of rare occurrence in *Trichomanes*. The *Trichomanes reniforme* of New Zealand, and the *Hymenophyllum fuciforme* of Chiloe, are noticed as having the capsules external to the involucre, but their being exposed to view was supposed merely to result from the spreading and shrinking of the valves. *Loxsonia* appears to be the only recorded genus as possessing that peculiarity of fructification.

[Observations have already appeared in the 'Phytologist,' on the supposed identity of our *Trichomanes speciosum* with the *T. radicans* of Jamaica and Brazil. The idea, I believe, originated with myself, and indeed there is sufficient superficial resemblance between the two, to warrant such a conclusion at first sight, but a careful comparison of the habit, rhizoma, stipes and involucre of the two species, would convince Mr. Andrews that they are well-marked and perfectly distinct. Mr. Andrews's observation on the fructification of the newly discovered variety (*Andrewsii*) is highly interesting.—E. N.]

Notice of 'Outlines of Structural and Physiological Botany. By ARTHUR HENFREY, F.L.S., &c.' PART II., Organs of Vegetation.

THE *second* part of this useful little book fully bears out our remarks on the *first*. In that notice we confined ourselves to a general expression of approval without giving examples of the author's labours, an omission which we shall now supply, premising that what may be wanting in the novelty of the passages we shall cite is abundantly compensated by the lucid arrangement of the matter. The chapter commencing this part is entitled "The Individual Plant," and the section which we cite "Morphological Considerations."

"In a former chapter it was stated that certain plants consist of a simple cell, and that all plants make their first appearance under that form; it is only at the extreme limit of the vegetable kingdom, however, that they remain in such a simple condition. The primary cell divides, but as an evidence of an advance in the scale of organization, these cells do not become independent of each other; on the contrary, remaining attached, they subdivide again and again, till we find individual plants composed of an innumerable mass of such cells. The plant thus begins to acquire parts or organs destined to perform functions distinct from each other, and subservient to the general nutrition and propagation of the whole.

"Looking at vegetables in their generality, we may say that a plant consists of three parts, the leaf, the stem, and the root; although in the lower classes it is often the case that one or even two of these are wanting. Advancing again, as in the case of the cell, we find that a plant may be composed of one of these individuals, or phytons as they have been called, producing its like, the progeny immediately obtaining an independent existence; or the new individuals may remain attached almost to an unlimited extent, constituting highly compound plants, the different organs or phytons of which undergo various modifications of form and acquire very distinct functions. Thus in a flowering plant, or, as a stronger example, in a forest tree, every leaf is to be considered as essentially a distinct individual; but as a member of a compound body, working for the general benefit of the whole. In obedience to the requirements of this, they undergo modifications to fit them to execute distinct offices in the economy of the plant; some are destined to the nutritive functions, others to the reproductive; and among these latter we find them still further losing

their individuality, and becoming blended in all their parts with their fellows, until almost all trace of their real origin is lost.

"This is the substance of the doctrine of Morphology, the most important generalization in the whole science of Botany, as affording a clear and systematic view of the vegetable kingdom as a whole (in addition to the important relations it establishes with Zoology); this general statement is as much as can be indicated at the present stage of the subject, the proofs and elucidations of the theory being those very facts to which the greater portion of the following pages will be devoted.

"The presence or absence of the middle portion or stem of the typical phyton characterizes the most important distinction in the condition of plants, and on this ground the primary divisions are established.

"Plants which have no axis, but consist of cellular expansions, are called stemless plants. The filamentous or foliaceous expansion is called a *thallus*, from whence the division has received the name of Thallophytes.

"Plants which possess an axis or stem interposed between the leaves and roots, either simple or compound, are called Cormophytes." —p. 47.

Chapter V. treats of the Axis and its Appendages: the first section describes the structure of stems, giving a separate consideration to Acotyledonous Stems, Monocotyledonous Stems, Dicotyledonous Stems, Ligneous System and Cortical System. The second section describes the root, and after a few general considerations we have the following detailed account of the root in the three different classes.

"*Acotyledonous Roots*.—The simplest form of the roots of this class are mere cellular fibrillæ, which supply the young stem with nourishment. When this has become developed it gives origin to adventitious roots; that is, the radicle merithal of each phyton becomes free. Roots are usually produced all round if the stem be erect, or on the lower side if the stem be horizontal.

"In the arborescent ferns these adventitious or free roots accumulate in such numbers that the base of the tree becomes increased in a conical form to two or three times the thickness of its real stem.

"The roots of these plants correspond in the nature of their elementary structures to the stems from which they grow; cellular in the cellular plants, as the mosses; in the Lycopodiaceæ and ferns, &c., they contain fibro-vascular bundles. These bundles, however, are generally central in the roots, enveloped in a layer of parenchyma,

which, in situations where it is in contact with the bundle, forms a hard brown or blackish layer. In some ferns and Lycopodiaceæ the fibro-vascular bundles lie within the external cellular portion of the stem for some distance before they become free in the roots. In old stems of some Lycopodiaceæ this parenchyma is separated from the central fibro-vascular column, and such descending bundles are found lying in the interval.

“*Monocotyledonous Roots.*—The radicle of germinating monocotyledons does not appear as a direct continuation of the stem, but breaks through the radicular extremity of the embryo. A layer of the superficial cellular tissue clothes this radicle as with a sheath at its base. Hence the embryos of this class have been called endorhizæ, and the sheath formed by the radicular extremity is termed the *coleorhiza*.

“The roots of monocotyledons are usually compound, and the branches are occasionally again divided. These partial roots, forming together the compound, are only temporary formations; if the stem is perennial they die in the order of their production, from the centre outward, new roots being developed in circles continually more external. The aërial roots commonly occurring in this class frequently exhibit this phenomenon. They are produced from various parts of the stem: in the palms the base of the stem becomes covered by the production of a large number of these adventitious or free roots, giving the base a conical form; in the *Pandanus* they are developed in a continually enlarging spiral, the most recently formed being the largest, and rising high up on the stem; the death of the lower roots and the gradual destruction of the base of the stem often cause these free roots to become finally almost the sole connexion between the stem and the earth. In *Dracæna* the descending portion of the fibro-vascular bundles which belong to the radicle system do not become free and develop adventitious roots upon the stem, but are found as *wood* beneath the cortical layer, until they reach the base of the stem, where they are united to a certain extent by parenchyma, so as to present a root somewhat resembling that of a dicotyledonous tap-root. *Cordyline australis* has two such main divisions, called by Mirbel *souches*. Here, however, the monocotyledonous structure is retained, the radicles are developed centrifugally, and break through the cortical parenchyma, which clothes them with a *coleorhiza*. The flattened stems in the bulbs of our climates exhibit also the centrifugal development of the radicles.

“The anatomical structure corresponds to that of the stems. The

fibro-vascular bundles are mostly situated toward the exterior, and a fibrous layer is often found beneath the cortical parenchyma. In small rootlets the bundle is sometimes reduced to a single vessel surrounded by cellular tissue. A difference of relative position occurs between the elements of the bundles in roots and stems; the large, porous vessels of the bundles are most external in the stem; in the root they are the most internal in relation to the axis of the root.

“Dicotyledonous Roots. — In this class we find the root presenting a great central aggregation of the descending system, corresponding and opposed to the stem. This kind of development of the root gives rise to what is called the caudex or tap-root, and is especially remarkable in trees, where its ramifications have frequently a definite relation to the size, number and extent of those of the stem. The caudex does not generally become prolonged down very far into the earth, but its branches acquire a great lateral development. Although this corresponds in some degree to the ramification of certain stems, the form and size of the stems and roots do not bear a constant relation. Either of the two systems may be proportionately much more extensively developed.

“The structure of the root may be considered as resembling exactly that of the stem devoid of pith, and consequently without the unrollable spiral vessels of its sheath. This is the real structure in most herbaceous plants, but not in all trees. The walnut, for instance, and the horse-chestnut exhibit a pith highly developed, extending to a considerable distance in the root.

“The growth takes place by the periodical production of new layers of wood and bark over the whole surface. The increase of length is strictly terminal, no interstitial growth of the cells occurring; the ramifications are prolongations from the parenchyma of the cortical system, in which the fibro-vascular bundles are very quickly developed, and become continuous with those of the parent branch.

“It has been mentioned that adventitious buds may occur under peculiar circumstances upon roots, even as they do in the bark of the stem. Adventitious roots may also be produced from the stem, a striking example of this being afforded by the rooting of cuttings by which plants are propagated in horticulture. The anomalies of stems, such as the coherence of contiguous ramifications into one, the formation of concentric rings of parenchyma, as in certain Menispermaceæ stems and some of the climbing woody Convolvulaceæ of Brazil, are frequently repeated in the roots.”—p. 65.

The next section treats of the Leaf, its “anatomical structure,” and

"form," and this latter, perhaps, is the least commendable portion of our author's labours ; in fact, a well digested arrangement and nomenclature of the diversified forms in this beautiful portion of every plant is still a desideratum in botanical science : we consider few botanists of the present day capable of undertaking the task and accomplishing it to general satisfaction ; indeed, only one who could combine the needful qualities of knowledge, industry and judgment ; and that one is Mr. Woods : he possesses an intimate knowledge of all that has been done, industry sufficient to collect it, and judgment sufficient to classify and arrange. Much that is useless and tautological has to be rejected ; uniformity and simplicity must be kept in view. It is true that Mr. Henfrey makes no attempt beyond that of giving a superficial view of the commonly received nomenclature, and even in this he has not fully succeeded.

The description of the leaves of Acotyledons, Monocotyledons and Dicotyledons presents nothing new or worthy of comment, but on the subject of "Arrangement of Leaves" we have some useful generalizations.

"In stems where the leaves arise one after another with the interposition of a certain length of the axis between them, the leaves are called alternate, and this, the commonest condition, offers the most favourable opportunity of detecting the spiral arrangement.

"Alternate leaves are rarely placed exactly upon opposite sides of the stem ; the second leaf will be found to arise rather on one side of the point above and opposite the first, and the third on one side of a line perpendicular to the first. In the apple the sixth leaf comes to be directly over the first, and a line drawn round the stem connecting all their bases will be found to be a simple spiral passing twice round the stem. The point where a leaf is found coinciding perpendicularly with the first, indicates the completion of a series or *cycle*, and thus in the apple the cycles are series of fives. Carrying the examination further up, we shall find the seventh leaf over the second, the eighth over the third, &c., until we reach the eleventh over the first and sixth, completing a second *cycle*.

"This arrangement in cycles of fives is that most common in Dicotyledons, but others also occur. The lime presents a very simple condition. Here the second leaf is directly *opposite*, and the third directly *over* the first ; the latter completing one spire and being the point where the second commences. This arrangement, which is called *distichous*, is found in many Monocotyledons, but spires contain-

ing three leaves, forming the *tristichous* arrangement, are the most characteristic of that class of plants.

"The spire becomes much more complicated where it contains many more elements, but the relations are found to be constant, and in plants exhibiting such forms the spiral arrangement becomes much more apparent, as in the *Pandanus* or screw-pine, the pine-apple, and among the *Coniferæ*.

"A little consideration renders it evident how this spiral disposition of the organs ensures the symmetrical distribution of the leaves, and the equable formation of new parts deriving their assimilated nutriment from them. A proof of this influence is afforded by the manner in which the form of the stem deviates from the cylindrical in those plants where the spiral arrangement of the leaves is least obvious. The various organs resulting from the higher states of development of the typical organ, namely, the floral envelopes, and even the carpels (as in the *Coniferæ*), are all subject to the law of spiral disposition, and the importance of this view in elucidating the structure of the flowers will hereafter be seen. In a large number of plants the law of arrangement just described does not at first appear to hold good, namely, in those which have *opposite* or *verticillate* leaves. But opposite leaves may be supposed to proceed from two spirals proceeding up the stem simultaneously, or from the non-development or shortening of the alternate internodes. The *whorl* or *verticil*, again, may be conceived to originate from the non-development of the internodes of a whole cycle, each spiral cycle being thus reduced to a circle. Examining the succeeding whorls, we do not often find the leaves of the second perpendicular to the first, but with their midribs over the intervals between those below. Supposing the leaves to be opposite, the second pair would stand at right angles to the first (*decussate*): if the whorl contained three, it would require a greater number of series before the leaves would again correspond vertically. In these cases the number of cycles or whorls required to complete the vertical coincidence constitutes a *rectilinear* series, and in opposite leaves consist of four cycles; where the whorls are composed of three leaves, of six, and so on. If the *pairs* do not cross exactly at right angles it will require several pairs to form a series, and these pairs follow a spiral arrangement like that which is commonly found in alternate leaves.

"Some authors contend that the normal arrangement of leaves is verticillate, and that the spire arises from the breaking up of this by the elongation of the stem. Those, on the contrary, who contend

that the spiral is the typical disposition; assume that the elongation is suspended from time to time, to allow of the accumulation of the cycle into a circle, and that each internode separating these circles is made up of as many internodes or cauline *merithals* as the whorl contains leaves."—p. 81.

There may be nothing new in all this, but it is clearly and neatly expressed, and much good matter is compressed without injury. It is, however, very evident that Mr. Henfrey's strong point is structure: he has not only read, but understood what has been done by our continental neighbours, and has taken the now unusual plan of following and verifying their observations. For a long time our magazines and other publications, in default of original contributions, have been crammed with translations from the German, not because such papers are good or useful, but because they are *German*: the Ray Society presents glaring instances of this, and circulates rubbish which the translators appear to understand as little as those who attempt to read it.* It is quite refreshing to find an author really understanding and appreciating the Germans, and from his own knowledge of the subject capable of digesting, and even in some instances, checking and correcting slight errors in their views, and this Mr. Henfrey has certainly achieved. We shall conclude our notice with the following extracts from Mr. Henfrey's chapter on the "Physiology of Vegetation."

"The vital processes are so intimately connected, and so greatly depend upon each other, that divisions into distinct classes or systems of function must be in a great measure artificial. But an arrangement sufficiently natural may be found by taking the phenomena in the order of their succession in the life of the plant; these, indeed, move as it were in a circle; the highest function, development, being at once dependent on and reproducing those of absorption and respiration; but since *absorption* must precede all else, and is that function which is most particularly dependent upon external circumstances, it affords a convenient starting-point. Next in order will follow the *circulation*, or to speak more correctly, the distribution of the fluids absorbed, bringing them within the influence of *respira-*

* An extraordinary puff of this Society has just appeared in the 'Athenæum,' but whether this puff be a legitimate bait for new members, laid by one of the salaried officers of the Society, or a paid advertisement, or a burlesque, slyly slipped into the editor's box by some malicious wag, it is difficult to say. Be this as it may, the puff, like the squeaking of Punch, arrests our attention, and we now feel it a duty to review a set of publications which previously we felt inclined to pass by without notice.

tion and *assimilation*, to render them fit materials for *development* and *secretion*. The term nutrition does not appear to be applicable to any process in vegetable life. Unlike animal organisms, where absorption is continually removing effete structures, to be replaced by the nutritive powers, the organs of plants are produced by development, which continues up to a certain point; the organ after this merely acts in consequence of mechanical structure, and when effete dies and decays. In plants all is *growth*, as distinguished from the *reproduction* of removed or decayed parts, which is the office of the nutrition of animals.*

“*Absorption*. — From what has already been said with regard to peculiarities of cell-membrane producing the phenomena of endosmose, it will readily be seen how perfectly the structure of the fibrilla of the roots is adapted to the absorption of the fluids around them. The nature of the development, too, of the radical tissues, the root always growing by its extremity, continually furnishes fresh cells in the most favourable condition for absorption. The absence of epidermis, that denser and more impermeable layer of tissue which is produced in other parts to moderate the transmission of fluids, is another important condition in the absorbing extremities; the delicate *epiblema* by which young roots are clothed being composed of cells which have lost none of their absorbent power, while their apposition as a continuous layer guards against the entrance of solid matter into the cavities of the internal parenchyma. The roots absorb only fluid, and all substances which afterwards present themselves in a solid form within the cells, such as crystals, &c., must have entered the plant in a state of solution. Experiments have been made, placing the roots of plants in water containing finely powdered solids, such as charcoal and colouring matters; these were always found to accumulate upon the surface of the root, but never to penetrate the tissues.

“Although roots thus reject all solid matter (and this is most probably a simple mechanical necessity), they do not appear to have any power of selection; they absorb poisons as readily as innocuous or beneficial fluids. Difference of the relative densities of fluids, as would follow from the recognition of endosmosis as the agent of absorption, is the only circumstance which requires any manifestation of preference by the absorbing surfaces.”—p. 96.

* Of course this generalization does not apply to ultimate or elementary tissues, but to those assemblages of structures for a special function commonly known as *organs*.

Experiment on the alleged conversion of the Oat into Rye.

By HEWETT C. WATSON, Esq.

LIKE Mr. Sidebotham (Phytol. ii. 589), I also tried the experiment of Dr. Weissenborn, last year, and without precisely following the instructions set forth. My departure from prescribed rules was on the contrary side from that of Mr. Sidebotham; the seed being sown earlier than it should have been. Expecting to be from home at the latter end of June, and wishing to have the oats above ground before I left, their seed was sown either a few days earlier or a few days later (I forget which) than the first of June.

It will be remembered that the summer was unusually wet and cold, and in consequence the young plants were kept in that state of constant green growth which our corn-fields usually show during a showery May. Many of the plants grew so rapidly that I was compelled to cut down some of their shoots repeatedly, as the only means of preventing them from throwing up culms, and, by flowering in the autumn, completely destroying the experiment. Out of two hundred plants, scarcely a score survived the winter. These came into flower about Midsummer (before and after) of this year. Every one of them was a genuine *Avena sativa*.

In accordance with the editorial comment upon Mr. Sidebotham's experiment, mine also may be objected against, because not literally in accordance with the instructions set forth by Weissenborn. Granted. But, even though we should literally follow the prescribed rules, both as to date of sowing and times of cutting down, the variations of seasons would still make the experiments differ.

Plants raised from seeds sown at Midsummer, in 1845 and 1846, would have been quite in a different state of growth and luxuriance in the August month of the respective years. During the earlier part of this year of 1846, various garden operations were necessarily performed a month earlier than last year, reckoning by dates, in order the better to accommodate them to the season.

Though very little disposed to put faith in Dr. Weissenborn's experiments, I was thrown upon making the trial so far, by the reply of a gentleman to whom I had spoken in slighting terms of the alleged results. His reply was, that the alleged result of one experiment could be refuted only by that of another and similarly conducted experiment. Such a reply is sound argument in general. Nevertheless, there must be some practical limit to the suspension of judgment in such cases. If there were no limit practically allowable, we

should be compelled to *not* disbelieve the old nursery receipt for making black roses, namely, by grafting white roses on black-currant bushes. We practically reject this, not on trial, but because analogies are against its probability, and because we see no intelligible relation between the act and the pretended result.

In the case of the alleged conversion of the oat into rye, there are circumstances which appear to warrant disbelief. Similar experiments are constantly performed by the natural agency of insects and other animals, which gnaw down plants; and yet no one has seen any generic change in the character of the plants induced thereby.

More closely resembling experiments are performed on a large scale by farmers, in their twice-mown crops of clover and ryegrass, and equally without any approximation to resembling results. The gardener, too, cuts down his rows of mustard or parsley, without ever seeing them change into cress or celery. The florist "stops" his choice plants, to postpone their flowering; and the only result is that of increasing the number and size of the flowers, or the plant grown larger and more vigorous in its roots and foliage. And lastly, besides these more or less analogical facts, which make against the credibility of Weissenborn's experimental results, there is absolutely nothing in the kind of experiment, or the mode of performing it, which could make us anticipate any other result than that obtained by Mr. Sidebotham and myself.

HEWETT C. WATSON.

Thames Ditton, August 2nd, 1846.

Extract from a letter from the late Mr. Edmondston to the Rev. Mr. Hore, by whom it is communicated.

"I WROTE you from Rio, and consequently need not say anything more regarding that loveliest spot under heaven. We left it on the 25th August, and speedily began to fall in with more boisterous and colder weather. After encountering the usual allowance of 'pamperos' off the Rio de la Plata, on the 19th September we reached the Falkland Islands, where we staid till the 30th. Alas! alas! what a miserable change from the palm and Acacia groves of Brazil—a wretched lot of long, low, bay-indented islands of quartz, covered with peat, a species of *Myrtus* (*M. nummularia*), an *Empetrum*, and a small, compound, *Hippophæa*-leaved shrub covering the soil. There is only one small settlement in the islands, consisting of a few misera-

ble wooden and turf huts. There are lots of wild cattle, which the settlers chiefly live on : they are taken by some Buenos Ayreans who live there, with the lasso. There are also lots of wild horses, one of which I shot in one of my rambles, and dined off him in the following manner. A large round mass of flesh, the skin adhering, is cut off and roasted, hide downwards, on the fire : this is termed ‘*carne con cuero*,’ or ‘flesh with the skin,’ and to a ravenously hungry naturalist, a piece of colt’s flesh treated in this manner, albeit roasted two minutes after the animal was galloping over the hills, and eaten without bread or salt, is no contemptible grub. You may laugh at my Tartar banquet, but had I not come across the unfortunate ‘cheval’ which furnished our meat, I had serious thoughts of supping on a turkey-buzzard, which *might* have been rather tough and somewhat carrion-tasted. Birds swarm everywhere at the Falklands, wild geese especially, and from being so little molested are so tame that they may be knocked down with the oar ; a gun, in fact, is almost superfluous. These birds are at this season found only along the sea-shore. Besides these there are two or three vultures, two penguins, the *Chionis*, and numerous other sea and shore birds. As it was the end of winter scarcely a single plant was in flower, and the heath was covered with tufts of withered grasses and *Cyperaceæ*. I got some very good *Cryptogamia*, especially lichens, five *Stictæ* and *Usneas*, and a good many *Algæ*, one species, a large *Iridæa*, scarcely differs from *I. edulis*, unless in size : it is sometimes four or five feet long. The shore is everywhere belted by an enormous growth of *Macrocystis pyrifera*, which extends to the depth of eight or ten fathoms, and renders landing in a boat frequently very difficult, or almost impossible. It grows in an immense matted mass, the stems being very slender, and each lanceolate, toothed leaf having at the base a large, oblong vesicle. From its excessively branched and entangled growth it is almost impossible to ascertain the length of any one plant, but I have unravelled thirty-three feet without any appearance of end, and I doubt not it attains 100 feet, or even much more. Another giant Alga is also abundant, the *Lessonia fuscescens*, before whose dimensions our *Laminaria bulbosa* and *digitata* sink into insignificance ; the enormous stems seem more like the trunks of trees as they lie on the sea-beach than anything else. The upper part of the stem is divided into an immense number of dichotomous branches, each of which is terminated by a lanceolate frond.

“I got specimens and live plants of the magnificent tussack-grass

(*Dactylis cæspitosa*). It was almost the only plant in flower in the islands.

"So much for the natural productions of the Falklands. A more villanous climate cannot be imagined, at least while we were there it blew and snowed without intermission, preventing anything like extensive excursions and occasioning the most exquisite discomfort. It was never moderate enough to allow me to have a day's dredging, even in our own large, fine cutter. Delighted were we to leave the Archipelago, *par excellence*, of storms, and did leave it on the 30th ult., and here we have been tossing ever since. Oh! this charming Cape Horn amply deserves its character; gale after gale, storm after storm, hurricane after hurricane. I wish you could have seen three gales we have had when we were scudding under bare poles. I never saw so magnificent a sight; but that ill makes up for other discomforts: the wind is always dead against, and we are half thinking that we must be distantly related to the Flying Dutchman. We leak like a spout, besides, I have six inches water in my cabin every morning. It is doubtless very pleasant, in awakening during the night, to be lulled again to sleep by the gentle music of running water in your cabin; but I am so unromantic as to prefer the contrary. However, one must put up with these small discomforts at sea; and in a week or two, the trade-wind and blue sky of the Pacific, will, we trust, welcome us, and waft us moderately, at least to Valparaiso. Our destination is somewhat uncertain, but as the season is so far advanced that the coasts of Mexico will be extremely unhealthy, it is probable we will see the Columbia River about June or July, and afterwards return to the southward, and endeavour in that way to cheat the 'Yellow Jack' of Guayaquil."

"THOMAS EDMONDSTON."

Distinguishing Character of Circea alpina.

Circea alpina.—"It is almost amusing to peruse the characters by which botanists ever since the days of Linnæus have been endeavouring to distinguish *Circea lutetiana* and *alpina*, which, whether individually or collectively, would, in any doubtful case, enable any one, except by chance, to tell the one from the other, even though the species are certainly distinct. The genus, until extended by Indian additions, consisted of those two species only, the fruit of the former of which is two-celled, with a single, erect seed in each cell, hence

the generic character 'ovarium 2-celled, fruit 2-celled, 2-seeded.' Such being the case in one species, it is inferred it must be equally so in the other, and the flower being small and fruit rarely produced, this is taken for granted. By taking it for granted botanists have puzzled themselves in vain, for at least a century, to find good specific characters by which to distinguish them. The ovary at once supplies this long-sought desideratum. *Ovary 2-celled, C. lutetiana. Ovary 1-celled, C. alpina.*"—*Wight's Illustrations*, vol. ii. p. 23.

New locality for Cyperus fuscus, Linn. By J. D. SALMON, Esq.

THIS plant, for which the only hitherto recorded locality is the Eel Brook meadow, Little Chelsea, near Walham-green, Middlesex, I had yesterday the good fortune to discover in great plenty on the margins of Peat-pond, on Shalford common, about two miles from this place. Your correspondent, Mr. Mill (*Phytol.* i. 146), who defends the practice of the dissemination of seeds of rare indigenous plants, on the ground that some species may otherwise be lost to Britain, particularly mentions *C. fuscus* as likely to be destroyed by the progress of cultivation or building. I am happy to be able to allay such fears by the discovery of yesterday, the plants growing in abundance, and in a situation not likely to be disturbed. Has Mr. Mill or any other gentleman carried out the suggestion in the article referred to, by introducing the plant here?

Since my notice of the 'Outlines of the Flora of Godalming' appeared in the March number of the 'Phytologist' of the present year, in addition to several new plants and stations, I beg to notice the occurrence of *Equisetum hyemale* in Wanborough wood, occupying an extent of two or three acres. I should think this is the most southerly station for this species yet recorded in England.

JNO. D. SALMON.

Godalming, 17th August, 1846.

Corrections of erroneous habitats given to British Plants.

By EDWARD FORSTER, Esq., V.P.L.S.

I TRUST you will find room in your 'Phytologist' for the correction of erroneous habitats which have been given to British plants.

In Turner and Dillwyn's Guide, *Crepis biennis* and *Crepis* (Bark-

hausia) *foetida* are stated on my authority to grow at Purfleet, in Essex, whereas, in fact, neither of them has been found there. At the time of the publication of that work, it must be remembered that *Barkhausia taraxacifolia* and *Crepis foetida* were not distinguished, the plant, therefore, called *Crepis biennis* is now *Barkhausia taraxacifolia*. The *Crepis foetida* was inserted in consequence of the celebrated William Curtis, author of the 'Flora Londinensis,' &c., having so pronounced a specimen in my herbarium, owing, doubtless, to the fruit being beaked, by which it will appear that this eminent botanist was better acquainted with the true *Crepis biennis* than with the more common *Barkhausia taraxacifolia*. The specimen is bad as to foliage, and it was simply from the fruit that Curtis conceived it to be *C. foetida*. Having searched many times since and found no trace of this species, I am well convinced that there is only *Barkhausia taraxacifolia* to be found there. Here I shall take the opportunity of saying that I differ from my friend Babington in referring to 'English Botany,' f. 149, for *Crepis biennis*, "*except the fruit.*" It appears to me that both figure and description belong to *Barkhausia taraxacifolia*, more especially as nothing is said about the fruit being added from another specimen. I had much pleasure, not long since, in being shown by Mr. G. S. Gibson and Mr. Joshua Clarke, the *Crepis biennis* at Littlebury, near Saffron Walden. I rather think I once found it at Harlow, but my specimen is not far enough advanced to judge.

I am also quoted for *Lathyrus hirsutus*, "near the shore above South End;" this ought to have been *Vicia bithynica*; *Lathyrus hirsutus* grows at Hadley Castle sparingly, and at Rawreth in abundance.

Having given you my own erroneous habitats of Essex plants, I will now notice those of others. Mr. Cooper, in the 'Flora Metropolitana,' inserts *Lepidium Smithii*, *Winch*. This, I suspect, I ought to have put among my own blunders; for I once fancied I had found *Lepidium Smithii* at Walthamstow, but I fear it was only *L. campestre* with a somewhat persistent style. This I probably showed to my late friend Winch, as I do not believe he ever was at Walthamstow except with me.

Centaurea Calcitrapa.—"G. P., Woodford." If ever there, I suspect it was planted by Warner. It grows wild abundantly in the marshes near Plaistow. "G. P." does not mean "Great Pond," as stated by Mr. Cooper, but Gravel-pit Pond. It is on the Forest, nearly opposite Hart, the house in which the author of the 'Plantæ Woodfordienses' lived, and is still called Warner's Pond.

Senecio viscosus. A blunder of Warner's, not to be found at or near Woodford.

Antirrhinum Orontium. Is an Essex plant, but I doubt its having been found it near Woodford.

Pedicularis palustris. Hardly to be quoted "near Woodford," though plentiful in the marshes near the Thames and sparingly near the sea.

Galium montanum of course means *G. saxatile*.

Vicia lathyroides. Warner intended *V. angustifolia*, as might have been seen by his reference to Ray.

Myrica Gale, "G. P." Not there; if ever it was it must have been planted.

Juniperus communis. Very doubtful.

Aspidium cristatum means *A. dilatatum*.

Buxus sempervirens. Not indigenous in Essex.

Cuscuta europæa. Should be *C. Epithymum*, which is the Forest plant. *C. europæa* is found in Essex, but not near Woodford.

Turritis glabra. Not to be found in Warner's habitat. I have seen it near Danbury church.

Epilobium angustifolium. I have never found this near Woodford. It grows on Little Baddow Common perfectly wild.

Saxifraga granulata. The nearest to Woodford that I have found this is Harlow.

Equisetum sylvaticum. By this is meant *E. fluviatile*; for though *E. sylvaticum* has been found at Highbeece, it is very rare. It grows in great plenty near Warley Common.

Astragalus hypoglottis. "On the Forest near Woodford bridge, Rev. S. Palmer." This must be an error.

Melampyrum sylvaticum. Should be *M. pratense*.

Bartsia alpina. "Near Thoydon, Rev. S. Palmer." Impossible!

Veronica spicata. "Rev. S. Palmer." As unlikely as the last.

Chrysosplenium oppositifolium. I have never seen this on the Forest, but it is possible, as it occurs in many parts of Essex.

Cuscuta europæa. "B. G." The 'Botanist's Guide' does not state this to grow in Epping Forest, but at Castle Hedingham.

Aspidium cristatum. "B. G." This is not in the 'Botanist's Guide.'

Aspidium Thelypteris. "Rev. S. Palmer." This does not grow at Chigwell.

Dianthus Caryophyllus. "Tower on the wall at Eastham." (L. W. Dillwyn ought to have been quoted from the 'Botanist's Guide').

I find there, *Dianthus plumarius*, to which most of the British habitats belong, as well as this.

Enanthe pimpinelloides. Purfleet. This means *Œ. Lachenalii*.

Actæa spicata. "Thick wood two miles from Thorndon, *Blackstone*." This seems very unlikely.

I have confined this list to Essex plants; but if you would wish to have it extended to other counties I will take some opportunity of doing so.

EDWARD FORSTER.

Woodford, 17th August, 1846.

Note on the White-flowered variety of Orchis latifolia, &c.

By CHARLES PRENTICE, Esq.

IN the 'Phytologist' of this month there is a note from Mr. Ogilvie, concerning the occurrence of the white-flowered variety of *Orchis latifolia* in the Highlands of Scotland. This variety is far from being so rare as he seems to consider it, for it occurs in considerable abundance on Roydon Green, near Diss, in Suffolk, together with the usual reddish, pink-coloured plant, though the white variety is rather the more frequent of the two. *Liparis Læselii*, *Utricularia minor* and *Cladium Mariscus* are found on the same fen.

With regard to Mr. Townsend's remarks on the occurrence of *Phleum arenarium* inland, I can state from personal observation it grows sparingly on Waltham Lyng, near Diss, in Suffolk. I once gathered a single plant of *Littorella lacustris*, on a wet part of the same heath, which is singularly barren and stony. I need not say it is quite inland. *Carex arenaria* does *not* occur there. *Liparis Læselii* is, I fear, fast being extirpated, as it is sure to be gathered with its roots, which, from the sandy, soft, boggy soil in which they grow are easily eradicated. The destruction of Gamlingay Heath has also taken away one of the best localities for this curious and rare plant, as well as for several others.

CHARLES PRENTICE.

1, Oxford Villas, Cheltenham.

[I do not consider the white variety of *Orchis latifolia* as a plant of uncommon occurrence. I have seen it plentifully near Loch Fyne, in Scotland, and near the Black Mountain, in Wales, besides occasionally in other localities. The white varieties of some *Orchidææ*

are exceedingly beautiful, and none more so than that of *O. Morio*, which I have occasionally met with in the vicinity of Leominster, in Herefordshire. In some instances the flowers were of a pure, unmixed white, while in others the green lines, which serve as an excellent distinguishing character of the species, were not only present but very conspicuous, greatly increasing the beauty and remarkable appearance of the flower.—*E. N.*]

BOTANICAL SOCIETY OF LONDON.

August 7, 1846.—John Edward Gray, Esq., F.R.S., &c., President, in the chair.

Donations to the library were announced from Mr. A. Henfrey, Mr. G. Rich and the Leeds Philosophical Society.

British plants have been received from Dr. Bromfield, Mr. C. E. Broome, Mr. James Lynam, Mr. Thomas Moore and Mr. John Thompson.

The following papers were read:—

“On the Potato Murrain,” by Dr. Lhotsky, and “Notice of the discovery of *Uredo Melampyri* (*Ayres*),” by Dr. P. B. Ayres. This new Fungus was discovered by Dr. A. at Anerley, near Croydon, Surrey, in July last. A specimen was presented.—*G. E. D.*

A few words on the first appearance of diseased Potatoes in a Garden. By HEWETT C. WATSON, Esq.

WITH reference to two remarks on the ‘Potato Fungus,’ in the ‘Phytologist’ for this month (p. 586 and wrapper), I beg to say a few words. Curious to watch the first appearance of diseased tubers, with reference to weather and ground, I became the practical potato-provider for my small household, taking up, with my own hands, all the potatoes used during the first two months of the season, from the open ground, namely, from the first week in June, to the second week of August, excepting a few days of absence from home. Being very much engaged otherwise about the middle of August, I transferred the duty of potato-digging into the hands of the gardener.

During the whole of that period, of about nine weeks, I did not find a single diseased tuber, nor did I observe any trace of the “fun-

gus" on the stems or leaves. But about the thirteenth of August, the gardener forked over the ground from which I had taken the potatoes, in order to sow turnips, and he found one potato which had been left in the ground, and that one was infected, as my cook said, and I can trust her eyes, exactly like the diseased potatoes of last year. Being from home that day I did not see it, nor hear about it until lost or thrown away by the gardener, who had cut it across to show its condition to the cook. The gardener has now been digging up potatoes daily for a week past, and has not found another diseased example. He also has scratched here and there among the later varieties, and finds no bad potatoes.

Last year, by this time, the disease had probably attacked a fourth or a third of the tubers of the same varieties. Is it not somewhat curious that the only potato found left in the ground should have become infected, and yet none of those attached to the roots or shoots of the living plants should be so affected?

I regret, however, to say that this immunity of my own garden from the pest, is no criterion of the condition of the fields and gardens of my neighbours; many of them being very seriously infested and damaged already. One instance was narrated to me, of a farmer offering to sell four acres of potatoes for a sovereign. I was watchful not to allow any diseased tubers to be planted. The potatoes hitherto got up for domestic use were planted in dry and loose earth; but some of the later crops, where the gardener's scratchings have failed to detect disease, are in stiff, loamy soil, which would grow wheat well, and did so within a dozen years.

Before the rains of August set in, I could hear of no bad potatoes in this neighbourhood. With us, the dry weather lasted until the day of the storm in London, on the 1st of August, when we had heavy rains, interspersed with some few large hailstones. During June and July we had very little rain; and, as I remember, only on one day was the ground wet by rain to the depth of two inches.

HEWETT C. WATSON.

Thames Ditton, August 20, 1846.

Notes on Polygonum maritimum and P. Raii, as grown together in flower-pots inland. By HEWETT C. WATSON, Esq.

IN the current volume of the 'Phytologist' (Phytol. ii. 45 and 333), are some brief notes on the approximation of *P. maritimum* towards *P. Roberti* (British Flora) or *P. Raii* (Bab. Man.), when cultivated inland in a garden. Last autumn I was kindly supplied with seeds of the British *P. Raii*, by the good offices of the Rev. W. S. Hore. Some of these were sown in flower-pots, at different dates in the spring of the present year; as also, seeds of the garden-descended *P. maritimum* (of Azoric origin, in 1842) in other pots at the same time.

The cotyledons of the two were scarce distinguishable from each other, in their stage of vegetation; but after the appearance of two or three of the earliest true leaves, the plants were so visibly different that had they all been pulled up by the roots and mixed together, it would have been perfectly easy to separate them into their two original species or varieties. This does not prove them to be permanently distinct, as species, although it may increase the probability of such being the fact; as it so far shows their peculiarities to be transmitted, without inter-commingling, for one generation, when external conditions are made equal.

In its early state, the *Polygonum Raii* might more likely have been mistaken for the ordinary corn-field form of *Polygonum aviculare*, than for *Polygonum maritimum*; but in its more advanced stage of flower and fruit, the resemblance became much closer to the *P. maritimum* than to the *P. aviculare*.

The young plants of *Polygonum Raii* grew quite erect until two or three inches high, when the stems suddenly bent at one of their lower joints, almost at a right angle, so as to give a horizontal direction to their growth. At the time of writing this notice (August 20), their stems and branches are eight to twelve inches long, still keeping to their horizontal mode of growth, and very slightly bending upwards at the growing extremities. They neither hang down over the sides of the flower-pots, as would any creeping or softer-stemmed plant, nor do they ascend much above the rims of the pots, except that, when wet by rain or dew, they incline below the horizontal line, apparently through increase of weight upon the wiry stems. Comparatively with those of *P. maritimum*, the ochreæ are thinner and much less nerved; and although pretty long at first, they tear and wear away more rapidly. The leaves are longer in proportion to breadth,

less coriaceous, rather less glaucous, bending upwards (or inwards towards the stem) between base and tip, and with less tendency to become revolute at their margins. The internodes are somewhat larger on the whole ; though this is not a well-marked character.

On the contrary, the young plants of *Polygonum maritimum* never became abruptly bent into the horizontal position. They increased in length, they gradually became procumbent at their base, with ascending or even almost erect branches. At a later stage they are distinguishable from *Polygonum Raii* by the harsher texture of their ochreæ, which have numerous, strong, dark russet nerves. The leaves are more ovate or oval, coriaceous, very glaucous, convex on the upper surface, revolute at their margins, from the tip backwards for the half or two-thirds of their length, and diverging from the stem or branch. The seeds are rather smaller ; but it is doubtful whether a botanist could again correctly separate the seeds of the two species if mixed together.

During our past mild winter, one of the last year's plants of *P. maritimum* survived in the open ground, and several in flower-pots in a cold frame. These have become quite ligneous at the bases of their stems or branches, and the internodes of this summer's growth are much shorter than was the case with those of first-year plants, during 1843, 4, 5, which were made annuals by the severity of our winters. Thus, as might have been anticipated, the length of the internodes proves to be only a fallacious character, changing with age and season.

So far as my garden-grown plants afford good distinctive characters—and these correspond well enough with my recollections of the wild plants on the coasts of England and the Azores—the specific or varietic (to coin a termination) characters may be taken as below. Between the prostrate plants of our own shores, and the lavender-like bushes of the Azores, evidently the growth of many years, the first-sight difference is wide enough. Whether this may not arise as much from climate and place, as from distinctness of species, may still admit of question. Compared with each other, the following characters will distinguish these two and *Polygonum aviculare* :—

P. maritimum.—Perennial. Stems ascending from a procumbent and ligneous base. Leaves coriaceous, very glaucous, convex above, revolute at the margin, diverging from the stem. Ochreæ with numerous, strong, dark nerves. Fruit large, smooth, shining, conspicuously longer than the perianth.

P. Raii.—Perennial? Stems prostrate. Leaves glaucous, plane,

but curving upwards from base to tip, so as to bend towards the stem again. Ochreae with few short nerves. Fruit large, smooth, shining, conspicuously longer than the perianth.

P. aviculare. — Annual. Stems prostrate or ascending. Leaves very variable in colour, form and consistence. Ochreae with few weak nerves. Fruit small, striated with elevated dots, opaque, shorter or slightly longer than the perianth.

HEWETT C. WATSON.

Thames Ditton, August 20th.

Notice of the 'Transactions of the Microscopical Society,'

Vol. II. Part 1.

THE Microscope, which has been too much the plaything of triflers, is now contributing largely to our knowledge of structure, and the Society founded in its name, is becoming a means of extending a taste for, and knowledge of, that branch of Natural History. Some of the papers read before the Society are of considerable value, and among such we may particularly mention three by Mr. John Quekett, which appear in the present publication; these are on the Cilia of the common Mussel, on the Structure of Feathers in the Owl tribe, and on the Structure of the Flabella in some of the Crustacea: the utility of these papers is unalloyed by the admixture of that mawkish and speculative philosophy in which modern discoveries are usually dished up; and they are therefore the more available for the real student of nature. But the crack paper of the session, that by Mr. Smee on Adipose Tissue, does not appear: this paper was peculiarly calculated to command the respect of the learned at home and abroad, and thus to elevate the standing of the Society, and we have reason to know that the publication of the present part of the Transactions was looked forward to with intense interest, on the faith of its containing a record of Mr. Smee's brilliant observations. What has become of this extraordinary paper? Has the author found that his statements are erroneous? Has the Society permitted him to withdraw it for separate publication? Has the publishing committee submitted the paper to some rival, but less successful, observer, who recommends its suppression? The members of the Microscopical Society have a right to know the truth: it is impolitic in the highest degree to allow such a paper to be withdrawn or suppressed, and equally impolitic to pass over its withdrawal or suppression in silence. The world has to thank Mr. Williams, the able Assistant-

secretary of the Society, for a very masterly abstract of Mr. Smee's paper which appeared in the 'Zoologist' for January, 1845.

It is however with Botany alone that we must treat here, and the only botanical paper in the part before us is on a monstrosity in *Agaricus personatus*, by Dr. Lankester, although we find but little of interest in the monstrosity itself, and not the slightest connexion between the monstrosity and the microscope; yet, for all this, there is a matter of great moment discussed in the course of the paper, and one which we think cannot fail to interest our readers.

In the first place let us premise that the monstrosity is thus described. The "agaric was dried up and decaying from the effects of frost.[] In all its parts, however, it exhibited a normal structure, with the exception of the pileus, in the centre of which, directly over the insertion of the stipes into the hymenium, a second and smaller hymenium was developed. The gills of the smaller hymenium were uppermost, and, presented towards the light, the edges were covered with the pileus, which gradually united itself with the pileus of the lower hymenium." A monstrosity very nearly if not exactly identical with this, was described long since by the Rev. M. J. Berkeley, and we have seen others too frequently to consider them worthy of especial notice. The 'matter of moment' is contained in the following passage.

"Before concluding this paper, perhaps I may be allowed to make one or two remarks on the Morphology of the *Cryptogamia*. It is only by the observation of abnormal forms like the present, that we shall be enabled to point out what are the real relations of one form of fungus to another, and classify them according to their natural affinities. Morphology has done much for classification amongst phænogamous plants, but little or nothing amongst the cryptogamous. The 'Transactions of the Microscopical Society' contain, however, the record of a single fact of monstrosity amongst the mosses, which has afforded an interesting illustration of the application of the principles of Morphology in the higher departments of the animal kingdom; Professor E. Forbes, in his paper on the Morphology of the *Sertulariadae*, having pointed out the analogy between the change of structure taking place in those animals and the mosses, from the similarity of form in their organs of nutrition and reproduction. Have we, then, in this fungus an analogous condition to that which has been found in the higher plants? If in the fungi we regard the pileus and stipes as the representatives of the leaf or nutritive organ in the higher plants, then the hymenium must be regarded as the analogue

of the flower, or reproductive organs. We may then suppose that under the influence of the cold or other external agent, an arrest of development in the vegetable tissue of the fungus would be attended with the development of reproductive tissue, as we know occurs amongst the higher forms of plants. It may be objected that we need some further proof that the pileus and stipes are really the analogues of the nutritive tissue. I think that this can be clearly made out by passing along from the fungi to the lichens, and from these to the *Hepaticæ* and the mosses and ferns, where every one will allow that the green parts are the nutritive tissue of the plant and the analogues of the leaves. There is one curious point with regard to the morphological structure of the fungi which I would here point out. It is that the whole body of the fungus is the analogue of the flower in the higher plants, the thallus of all the *Cryptogamia* being in this family as its minimum of development; the only analogue of the thallus being the mycelium, which is seen in the early part of the development of all fungi, and disappears when the hymenium is developed. I may perhaps here be allowed to mention how beautifully this fact confirms the relation of polarity which Professor E. Forbes has pointed out, as existing in every part of the animal and vegetable kingdom. The *Fungi* and the *Algæ* must be regarded as parallel groups, and in fact, up to the present moment, there is no definition that will distinguish between many of their groups, so that a whole tribe, *Byssoidæ*, are referred sometimes to one, sometimes to the other, and sometimes distributed variously through each. The characteristics of the concentrate sphere are a tendency to concentration in the organs of reproduction, to the formation of an internal skeleton in the organs of support, and to a unity in the combination of its parts. Of these three characters the fungi are a remarkable exhibition, as seen in the Agarics, and generally in the higher forms of *Hymenomycetes*. On the other hand, the characters of the articulate sphere are a tendency to elongation, the formation of an external skeleton, and articulation, all of which characters are conspicuous in the *Conserveæ*, the *Laminariæ*, and other forms of the family *Algæ*. The whole fungus may then be said to be the analogue of the flower, and just in the same way as the calyx and corolla stand in the relation of nutritive organs to the more especially reproductive stamens and pistil, so do the pileus and stipes stand in the relation of nutritive organs to the hymenium."—p 34.

In this long and somewhat obscurely worded paragraph we find the "pileus and stipes" regarded "as the representatives of the leaf or nutritive organ in the higher plants," and "the hymenium as the analogue

of the flower :” we are next told that “the whole body of the fungus” is “the analogue of the flower in higher plants” and lastly we learn that “just in the same way as the calyx and corolla stand in the relation of nutritive organs to the more especially reproductive stamens and pistil, so do the pileus and stipes stand in the relation of nutritive organs to the hymenium.” It must be admitted that these assertions are rather obscure and contradictory, and of course it is no part of our duty to explain or harmonise them ; the pith of the paragraph is in this line, “*the whole body of the fungus is the analogue of the flower in higher plants.*” Now we believe this to mean that an agaric, a mushroom for instance, is merely the flower of a plant, and not an entire plant, as has been so frequently supposed. This we take to be a true and valuable observation. Some years have elapsed since a paper was written and handed about among botanists, entitled the ‘Theory of Fairy Rings.’ It was pronounced to be wild and hypothetical, and the author was dissuaded from committing himself by its publication. But although all agreed in pronouncing the entire paper worthless, some parts of it were thought less exceptionable than other parts, indeed it found readers who condescended to borrow a passage here, and an idea there, to patronise a fact, or adopt a suggestion, until in one shape or other the contents of the paper have been pretty widely disseminated, although the paper itself was pronounced valueless.

The ‘Theory of Fairy Rings’ was something in this way. The seed* of an agaric was supposed to be carried by the wind to a certain spot in some open down, and there to germinate ; assuming a shape totally different from the mushroom from whence it sprang, it was supposed to become entirely subterranean, to consist of white tortuous thread-like fibres, the ramifications of which radiated from the spot where the seed had fallen, their extremities forming the circumference of a small circle, the extent whereof was shown on the surface of the soil, by the short herbage assuming a more intense green. Up to this point it must be admitted much was conjectural, but here observations and admeasurements began : the circles were found to increase annually in size, and while the circumference retained the brighter green, the centre reassumed the usual livery of the down. Experiments, carefully conducted, proved the existence of the fibrous fungus beneath the greener circumference of the circle and its absence from the superficies. Here then appeared to be a new plant,

* We use the term in preference to either of the odd names which have been invented to mystify beginners.

a subterranean, fibrous, fungoid vegetable : it spread from a common centre, and while it extended itself in every direction around the margin of the green ring which superficially marked its presence, it seemed to perish and disappear from the inner margin.

The next noticeable feature in the case was, that from these green rings issued a number of agarics ; a fact familiar to all botanists, and to every shepherd who traverses the downs. Some of the rings produced but two or three agarics, some produced them in tens, some in hundreds ; but very few of these fairy-rings were wholly unproductive. It was a work of little trouble to establish the fact that these agarics were connected with the subterranean fibrous fungus before described ; they were found in a state of absolute continuity with this fungus. A parallel instance occurs in the common mushroom, except as regards the uniformity of its figure : the cultivators of this delicious esculent purchase and plant a fibrous fungus, in order that they may gather one totally different in all its characters. They know it by a different name ; they plant *mushroom-spawn* that they may gather *mushrooms*, exactly as they would plant a *gooseberry-bush* that they might gather *gooseberries* ; and the two processes are conducted with equal certainty of success.

We believe it to be incontestible that the fine powder emitted by the fungus tribe is reproductive seed : we see multitudes of agarics rising in the course of a night, emitting seed and perishing : there is no other vegetable so evanescent. Now, if we admit the connexion of the agaric with the fungoid fibrous vegetable usually known as the *mycelium*, *thallus*, or *spawn* ; if we admit the evanescent character of the agaric, and the enduring character of the spawn—and who shall resist these admissions,—we are driven either to the illogical conclusion that the spawn is an entirely subterranean perennial vegetable, and the agaric a parasite whose seeds have to penetrate the earth, in order to find a fitting substance whereon to germinate, and that this fitting substance is supplied in the spawn ; or, that the spawn is a subterranean vegetable *except* when pushing its blossoms to the surface, in order that its seeds may be dispersed on the wings of the wind, and that the agarics *are* those blossoms.

If it be asked why the presence of the spawn should alter the colour of the grass on the surface ? we acknowledge the question to be one of great interest, but at the same time we must maintain, that our inability to give a satisfactory reply, in no degree militates against the theory we have ventured to propound. The presence of the spawn beneath the turf of the fairy-rings is indisputable, and we

could quote numerous authors who have born witness to the fact, if our own evidence were considered insufficient. It should here however be observed, that this alteration in the colour of the turf is not the constant concomitant of the presence of agaric-spawn: on the contrary we have found this appearance produced by a very limited number of species: and in some meadows where agarics (particularly mushrooms) abound, fairy rings are altogether absent. It should further be observed that the figure assumed by the spreading spawn may be either regular or irregular: in the mushroom it is certainly irregular: this variation has an exact analogue among phænogamous plants; in the Umbelliferae we have perfect regularity in the disposition of the flowers; in almost all other orders great irregularity.

A series of observations made on the common mushroom during several successive years, have furnished additional presumptive evidence, that they are the flowers of some plant which is concealed from the eye. The mushroom-gatherers also supply this evidence: from them it appears that *common* meadows, and meadows having a much frequented right of way through them, are tenfold more productive than neighbouring meadows, which are strictly private; and hence there is no temptation for the mushroom-gatherer to trespass or break hedges. The solution of this curious fact appears to us very easy: there is in almost all plants, in an ordinary state of health and vigour, a tendency to produce blossoms: if this propensity be allowed free scope, the plant puts forth its blossoms, and rests content with its achievement: but, if the blossoms are nipped off in the bud, the propensity is not satisfied, the end not being accomplished; and the plant, in many instances, will continue to produce flower-buds, each succeeding supply being more numerous than the first, but the size being generally much diminished. Now this is precisely the case with mushrooms: picking them as fast as they appear interferes with the design of nature in producing them: nature redoubles her efforts, and the supply becomes far greater in number, but, at the same time, the individuals are diminished in size. Now, were we to regard a mushroom as an entire and perfect plant, it seems to us very obvious that the avidity with which they are sought and gathered, before they can by any possibility shed their seed, must soon exterminate the race in such public localities as those we have described, instead of perpetuating, increasing and improving the supply, as is confessedly and most incontestibly the case.

It is with great pleasure that we have perused a pamphlet from the pen of Mr. Allies, in which he touches (with his usual ability) on the

interesting subject of Fairy-rings. After alluding to the theory here broached of their being "caused by a species of vegetable matter, which progresses from the centre of each of them, and spreads larger and larger in a circle, causing the grass to be greener on the rim than it is either within or without the circle;" Mr. Allies proceeds to inform us that "upon the rim of one of them being dug into, a whitish, fibrous, starchy-looking matter appears under the sod, amongst the roots of the grass, and at certain seasons, several species of Fungi or agarics grow in great number on such rims." In a note to the word 'fibrous' Mr. Allies adds, "That it is fibrous I believe there can be no doubt; for several years ago I had a portion of it examined by a gentleman, with a powerful microscope, who pronounced it to be fibrous." Of course, no one will doubt that the spawn is fibrous after such authority as this, but we arrived at the same conclusion by the assistance of our unarmed eye. And here we would have laid down our pen, and reckoned our case established, but "*Audi et alteram partem*" is a wise and unanswerable rule; we therefore cite an authority on the other side of the question. In the Wiltshire Collection of Aubrey relative to the 'fairies,' published about the middle of the seventeenth century, we have the following theory of Fairy-rings. "As to these circles, I presume they are generated from the breathing out of a fertile subteraneous vapour, which comes from a kind of conical concave, and endeavours to get out of a narrow passage at the top, which forces it to make another inversely situated to the other, the top of which is the green circle."

The reader is permitted to adopt the theory of which he most approves.

O. P.

The Indigenous Plants of the Mauritius.

NEARLY sixty years ago, a paper was read at a meeting of the Linnean Society, which must have occasioned no little mirth among the members present. It was written by Sir J. E. Smith, the Founder and first President of the Society, and entitled a "Review of a Dutch edition of the *Systema Naturæ* of Linnæus." This book was a folio volume, in Dutch, French, and English; and was published at the Hague, in 1765. Sir James says: "I have often contemplated this production with equal wonder and contempt, and have amused myself in conjecturing how the ignorant compiler of it could fall into such strange errors as he has done." Passing strange, indeed, are

some of his errors; and truly are they described by the author of the review as being "like the ravings of a maniac, whose origin or connexion cannot be traced." But some of our readers will ask, "what has the learned Dutchman's '*Systema Naturæ*' to do with the plants of the Mauritius?" We reply, simply this; that in the year of grace, 1846, eighty-one years after Mynheer Staatman, of the Hague, put forth his curious tri-lingual '*Systematis Linnæi corruptor*,' as Haller calls it, there is published in London, by a respectable house, the first volume of a work of much pretension,* in the appendix to which may be found an exact parallel, so far as blunders go, to the ingenious old Dutchman's puzzling production.

With the historical, political and statistical portion of this volume we have nothing to do in this place: our business is with that part of the appendix which professes to give an account of "The Indigenous Plants of the Mauritius," and to which we turned in expectation of finding something new and interesting relative to the plants of a spot rendered classical by St. Pierre's charming tale, 'Paul and Virginia.' Something new there undoubtedly is; for we were wholly unprepared to meet with such a farrago of ignorance and error as is here put forth under the authority of a "B.A., F.R.G.S.;" and again quoting from the review of the Dutch book, we may truly say that "with respect to the vegetable part, a young student might be much misled by this work, and an old one puzzled in no small degree." We could not understand the matter at all, until turning to the introductory paragraph, we found a statement to the effect that "the author had collated a rather detailed account of the plants indigenous to the Isle of France from the German and French botanical works of the last century." Here, then, is the key to the mystery. The author, utterly ignorant of Botany, yet conceited enough to suppose he can, unassisted, add value to a book by subjoining details of a science of which he absolutely knows nothing, gets together a heap of descriptions from the "French and German botanical works of the last century," and without consulting any competent individual, of whom many might be met with in the metropolis, both able and willing to render their assistance, sets to work, and, like the Dutchman, turns to a dictionary for every word; and though his perseverance may deserve all praise, yet the result shows that "perseverance without judgment

* England's Colonial Empire: an Historical, Political, and Statistical Account of the Empire, its Colonies and Dependencies. By CHARLES FRIDHAM, Esq., B.A., F.R.G.S. Vol. I. The Mauritius and its Dependencies. London: Smith, Elder, & Co., 65, Cornhill, 1846.

may often go very far out of the way;" for his article on 'The Indigenous Plants of the Mauritius' is such a precious compound of conceit and "ignorance as in the present age one would hardly expect to meet with."

That our readers may not be required to take our assertions on trust and without proof, we subjoin numerous extracts quoted *verbatim, literatim et punctatim*: beginning with the introductory paragraph, in which the author sets forth that "He may be allowed perhaps to remark that no English botanical work (and he has searched the most eminent), contains a correct list of the indigenous plants of the Mauritius. * * * He flatters himself, therefore, that the labour he has devoted to this investigation may be found useful even to the naturalist. In the arrangement of the genera, the author has preferred the Jussiean to the Linnean system as being less complex, and therefore better understood."

So far the plan was good; and there is nothing to complain of but the bad execution of it. And first with respect to the author's idea of what he calls the *Jussiean* system, but which, from its originality ought rather to bear his own name. We doubt whether either of the illustrious naturalists apparently alluded to, would willingly accept the paternity of the following arrangement. Euphorbiaceæ, Meliaceæ, Myrtaceæ, Malvaceæ, Leguminosæ, Piperaceæ, Polypodaceæ, Convolvulaceæ, Solanæ, Pandanæ, Palmæ, Cyperaceæ, Sapindaceæ, Rosaceæ, Verbenaceæ, Rubiaceæ, Terebinthaceæ, Sapotæ, Compositæ, Urticeæ, Osmundaceæ, Bixaceæ, Bythenariaceæ, Bixineæ, Onagraceæ, Campanulaceæ, Rhamni, Vagumlati Olocarpi, Annonaceæ, Aristolochiæ, Asphodeleæ, Labietæ, Homelineæ, Capparideæ, Acanthaceæ, Orchideæ, Asclepiadeæ, Ulmaceæ, Caryophylleæ, Aroidæ, Laurineæ, Sarmentaceæ, Smilaceæ, Superflua, Iridoeæ, Passifloreæ, Tiliaceæ, Musaceæ, Amaryllydeæ, Epidendreæ, Scitamineæ, Oxalideæ, Melastomaceæ, Hemerocallideæ, Connaraceæ, Combretaceæ, Plantagineæ, Oleineæ, Cucurbitaceæ, Boragineæ, Sterculiaceæ, Apocyneæ, Commelineæ, Æsculiaceæ, Jucoidæ, Menispermæ, Aurantiaceæ, Rhizophoreæ, Cordiaceæ, Arialaceæ, Gentianeæ, Santalaceæ, Hymenomycetes, Umbelliferæ, Chlenaceæ, Nymphiaceæ, Ebenaceæ, Gramineæ.

We entreat our readers not to skip the above formidable array of names (which, by the way, are followed by a supplement, equally clever), for they really display considerable ingenuity, both as regards location and orthography, both particulars being strictly observed in our quotation. But better remains behind.

The Dutch editor of the work we have before mentioned, in his laudable endeavour to Anglicise the Linnæan Latin, sometimes makes a strange mess of it; thus, "in Syngenesia, he says, 'the males and fructifyers are monstrous.' In Gynandria, 'the males and females have the members monstrous.' In Monœcia, 'the males and females live in the same place, but in different *pipes*.'" Laughable as this is, we find its parallel in some of the enumerations of the plants belonging to the various orders of the above unique system. Thus:

"Euphorbiaceæ are a genus of evergreen shrubs, named after Euphorbus, physician to Juba, king of Mauritania, who first used this plant in medicine: it has a number of species, which are natives of Mauritius, and were discovered there by Commerson, viz., *Euphorbia à feuilles de Poirier* (*pyrifolia*), peduncle subumbelled; *à feuilles de thym* (*thymifolia*), *Tithymalus humilis* of Commerson. This noxious plant (which is dichotomous) renders almost sterile the fields it infests; *à feuilles d'estragon* (*dracunculoides*), umbel trifid. *Splendens*, the finest of the genus, grows to the height of four feet, and flowers in June and September, branchlets covered with straight spines; *hypericifolia*, found near St. Louis, leaves subvillose underneath: *hirta*, this species has some resemblance to the preceding. *Thesé* (*Securinea nitida* or *durissima*), is the Otaheite myrtle, so called by Commerson — from *securis*, a hatchet — because the wood was so hard as to be capable of being manufactured into cutting instruments: an evergreen timber tree, flowers in June or July; this species, which grows at Mauritius to the height of forty feet, is one of such varied appearance that it is scarcely possible to assign them a character in common; in cold countries their vegetation is mostly herbaceous; in hot, fruticose. *La ricinelle* (*Acalypha integrifolia*), an evergreen shrub, flowers diœcious, of a pale green colour, and appear in June and September, grows to the height of five feet; *à epis filiformis*, *Acalypha filiformis*. *Kirganelia virginea*, or *Phyllanthus casticus*, vulgo bois de demoiselle, is a pretty little tree, six or seven feet high, a genus of the chilotydone, but of the family of the Euphorbias: fruit an oval red berry, which finally becomes black. Another species is found: the *Croton Mauritanum* and *aromaticum* are both indigenous to the Mauritius. *Gluttier à feuilles obtuses* (*Sapium obtusifolium*), leaves cuneiform; discovered by Commerson. To these may be added, *Phyllanthe en buisson* (*dumetosa*); found by Commerson at Rodriguez."—p. 356.

The above quotation needs no comment: indeed, if our readers understand some parts of it, we candidly confess it is more than we

do. The definition of the order, number of species, &c., are rich. We proceed:—

“To the Leguminosæ belong *Cylista albiflora*, an ornamental evergreen twiner, six feet high; flowers white, and appear in April and May, corymb larger than calyx. The *Crotalaria* are a numerous genus: *Crotalaria verrucosa* is found near St. Louis; *sericea* exists in the same locality, and flowers in March; *striata*, an ornamental evergreen, three feet high, flowers yellow; *angulosa*, leaves hastato-lanceolate; *arborescens*, an ornamental shrub, resembling the *cytissus*; and rises to the height of the common *bagne nandier* (four or five feet), whose name it bears at the Mauritius, and is charged for many months of the year with numerous bouquets of flowers very agreeable to the eye; it is especially remarkable by its stipules, which fall off as soon as the flower withers; it is distinguished by many shades of difference from the preceding; the flowers are beautiful, but it bears no fruit; *purpurascens*, is from one to three feet high; *pentaphylloides*; this flower has entirely the aspect of a *lutin*, flowers of a yellow colour, and disposed in clusters. *Acacia à fruit aîle*, or *Mimosa pterocarpa*: the wood of this tree is of a yellowish-white, fruit is in a shell, and is remarkable by a longitudinal wing. *Aspalat soyeux* (*Aspalathus sericea*), leaves silky; this flower resembles an *Absinthe*; it grows several feet high.

“*Courbrail verruqueux* (*Hymenæa verrucosa*), found in the Isle of France by M. Smeathman. *Indigotier des Indes* (*Indigofera Indica*), the pendules of this plant are subteretal. There is another species with shorter legumes.”—p. 358.

What can the man here mean by saying that the *corymb* of *Cylista albiflora* is “larger than the *calyx*?” What is the *bagne nandier* to which the *Crotalaria arborescens* is compared? And the description of the latter plant is in itself somewhat novel, particularly where it is stated to be “especially remarkable by its *stipules*, which fall off as soon as the flower withers.” Most extraordinary plants these! But one of the most extraordinary, perhaps, of all the novelties is the new position given to the genus *Grammitis*, in the midst of the *Compositæ*. Thus:—

“*Lactuc de l’Isle Maurice* (*Lactuca Mauritiana*), found in the woods; *Epervière filiforme* (*Hieracium filiforme*), stem filiform, leaves spatulated. . . . *Grammite naine* (*Grammitis pumila*) resembles the *Pteris cheilanthoides*, fronds sub-bipinnate, resembles the *cheilanthus*; *Gnaphale feuille* (*Gnaphalium foliosum*), fruticose, found by Labillardiere; *proteïdes*, flowers subglobular, found on the

summits of the most arid mountains, and the clefts of perpendicular rocks;" &c.—p. 363.

"To the Vagumlati Olocarpi belong *Orthotric pliasé* (*Orthotricum plicatum*), flowers axillary, leaves imbricated, angulosum, stem short, flowers axillary; pallidum, leaves a pale green; there are several varieties of this species, which with the others, was discovered by Thouars; *Hypnum intortum*, stem creeping."—p. 364.

The Vagumlati, from the names given, we presume to be mosses, which are as much out of place here as *Grammitis*, which is a fern, is among the *Compositæ*.

"To the *Asclepiadeæ*, *Cynanque vomitive* (*Cynanchum vomitivum*), stem villous, corymbs lateral, called also *Ipecacuanha*; the root is a vomitive, and when bruised is given as a dose."—p. 365.

"To the *Iridoeæ* belong *Glayment à larges feuilles* (*Gladiolus latifolius*), leaves hairy; *Dufoure à trois rangs* (*Dufouria trifaria*), leaves trifarious, this plant lies between the mosses and *Lycopodes*, is found in the waters."—p. 366.

Here is another puzzler. From the name of *Gladiolus* being given, we presume *Iridoeæ* means *Irideæ*: but then what can be the *Dufouria*, which "lies between the mosses and *Lycopodes*," and "is found in the waters?" Certainly it can have nothing to do with the *Irideæ*; but may possibly be the *Tristicha* of Thouars (*Dufourea*, Bory), one of the *Podostemaceæ*.

"To the *Scitamineæ* belong *Alpinia magnifica*, an evergreen herbaceous plant of a splendid character, it is ten feet high, and flowers in August, the colour is red, leaves broad. Sir W. Hooker says of this species, 'It is one of the noblest plants that has ever graced the pages of the botanist.' This plant is stemless, and very fragrant."—p. 366.

Here our ingenious author is tolerably correct, so far as the order of his plant is concerned; though the name of Brown's *Scitamineæ* has been sunk in that of *Zingiberaceæ*. A stemless plant, ten feet high, must, however, be a curiosity.

"To the *Cucurbitaceæ*, *Luffa fœtida*, a dicotyledone, male flowers racemose, this is a species of gourd."—P. 367.

A *monocotyledonous* member of the *Cucurbitaceæ* would be something "new and strange."

"To the *Menispermæ*, *Lampourde commune* (*Xanthium strumarium*), stem unarmed, fruit terminal; there is another variety, with more angular leaves and more acute lobes, which flowers in July."—p. 367.

We here have an Asteraceous (or Composite) genus placed in an order with which it would be somewhat difficult to trace any connexion.

But we fear that by this time our readers are as tired of the vagaries of this ingenious blunderer, as we ourselves are ; before we take leave of him, however, we must quote his description of the sea cocoa-nut (*Lodoicea Seychellarum*). Some parts of this precious document are so laughable, that we trust we shall be excused for introducing one of the most curious botanical productions that has appeared since our old friend, the Dutchman, figured *Ferraria Pavonia*, and called it *Eriophorum*.

“*Lodöice des Maldives or Seychelles (Coco de mer)*, of the genus *monoclytedones*, and the family of the palms, is one of the most extraordinary and valuable productions in nature, and may be classed among the *Lataniers*, though it resembles the cocoa-nut in many respects. It is unarmed; the fronds bipinnate, folioles bifidal, flowers dicæious, and grows to the height of from fifty to eighty feet. It is perfectly straight, but its circumference is small. Every tree bears about twenty or thirty cocoa-nuts, weighing from twenty to twenty-five pounds, each of which are borne on a peduncle of six feet in length. The head is covered with from ten to twelve palms, of nearly twenty feet in length. The pedicle is sloping in its contour. The leaf is in the shape of a fan, and has a fuller appearance than that of the cocoa. The wood of this tree is very hard at the surface, but the interior is filled with soft fibres. After being cleared and deprived of its interior fibres, the trunk, which differs little in form from that of the ordinary cocoa, but is harder and thicker, is of use for making tanks to receive water, and palisades for dwellings and gardens. The common name is *coco de mer*, which was given by the Portuguese, the first discoverers; because, in their early voyages to the East Indies, they discovered several of these nuts cast up by the sea on the coasts of Malabar and the Maldives; and as they could never find any at all resembling them elsewhere, they were led to believe it a marine production. The husk, from which rope is manufactured, resembles, in colour and fibrous consistency, that of the cocoa-nut. The form of the nut is bizarre. The shell is thick, large, and fibrous, and divided into two compartments, containing a light-coloured and transparent gelatinous substance, which, though brought to table and good to eat, is without any flavour, and as a fruit valueless. The shell of the nut is employed in the construction of pitchers of different forms; those designed to bear water are formed of the whole nut, bored at the top,

the contents of the interior being scooped out. The negroes carry them suspended from the top of a stick. They will contain from six to eight pints of water. They are an object of commerce for this reason, and highly prized by sailors from their not being subject to breakage. They can be grained, and will take a most excellent polish. When sawn in two, these shells serve as dishes and plates for the negroes. Brooms and baskets are made of the ribs of the leaves, and mattresses and pillows are stuffed with the down attached to the leaves. The pistil of the flowers gives, when ripe, a spherical fruit of from eight to ten inches in diameter. The seed-vessel is about two feet long, and three inches in diameter, studded with small yellow flowers, issuing from the angular projections, which resemble those of a pine apple. When stripped of its hair, this fruit, mulieris corporis bifurcationem * * * representat. Another fact connected with this singular production is, that the smell arising from it after some days is so offensive (resembling human excrement, * * *) that its vicinity is hardly bearable, which increases the longer it is kept. In proportion as the fruit dies, the jelly is changed into a hard kernel like a horn. The stem of the leaves proves highly serviceable in constructing the negro huts and the cottages of the lower order of farmers, while from the young leaves, when dry and cut into twists and lashes, hats are manufactured of a superior quality, which are universally worn in the islands by all classes male and female. The old leaves serve to cover the roofs. With one hundred leaves a commodious cottage may be erected, covered in, doors made, with windows and partitions to chambers. At Praslin most of the cottages of the labourers are thus built. Besides these purposes, there are many more to which this extraordinary fruit is applied. So important is this tree to the Seychelles that its loss would be more severely felt than that of any, production of which they can boast, yet its cultivation appears to be totally neglected. It is an extraordinary fact that the tree which bears the nut is *known only* at the Seychelles, and even there is confined to two islands alone, all efforts to transplant them to others having proved fruitless, though the whole group apparently possess the same soil and climate. Praslin and Curieuse are the two upon which they flourish, growing in the interstices of the rocks. Immediately at the junction of the leaves with the trunk of the tree, hang the nuts and seed; the former about a foot long and eight inches thick. The Indians held these nuts in high estimation, attributing to them many curious and salutary properties, and, indeed, the value set

upon them throughout Asia was once so enormous that, previous to the discovery of these islands, a single nut has been known to sell for between £300. and £400. and the Indian princes had cups made of them, ornamented with gold and precious stones; but since the French traders furnished the Indian market with them more plentifully, they have lost much of their estimation and with it their rarity. Among the different properties which have been attributed to this tree, some are fabulous, and the others are not sufficiently consistent. The physicians of Asia pretended that this nut was an antiscorbutic, would effect a radical cure of the venereal disease, and was an antidote against poison. It was also believed that the kernel had an astringent quality and might be used to remove dysentery. It is known to botanists as the *nux medica*. The discovery of this nut on the coasts of the Maldives and Malabar, more than four hundred leagues from the place of growth, is useful for making known the direction of the currents."—p. 398.

We fully agree with our friend when he says that his *Coco de mer* is one of the most extraordinary productions in nature; since a tree which possesses the following characteristics must indeed be a phenomenon. It belongs to "the genus *monoclytedones*." "The head is covered with from ten to twelve palms, of nearly twenty feet in length. The pedicle is sloping in its contour." "The *pistil of the flower* gives, when ripe, a *spherical fruit* of from eight to ten inches in diameter," though "the *seed-vessel* is about two feet long, and three inches in diameter, studded with small yellow flowers, issuing from the angular productions, which resemble those of a pine apple." We need not dwell on the extraordinary fact described in the untranslated passage, nor on that mentioned in the succeeding sentence: the kernel being "known to botanists as the *nux medica*."

We know not the nature of "the sternest possible ordeal" to which the author assures us "*every part* of the work has been subjected:" we can only advise him, and that seriously, to subject the sixteen or seventeen pages filled with such rubbish as we have quoted to an ordeal still more *stern* than his "sternest possible,"—the ordeal by fire.

O.

On the Potato Disease. * By P. B. AYRES. M. D.

At the request of the Secretary of the Society, I have drawn up the few following hasty observations on the affection of the potatoes, which has contributed to produce so powerful an effect on our economical

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and political relations. The extensive and serious re-appearance of the disease in the present crop of that useful plant, has rendered the affection of equal interest this season. Many and various causes have been assigned for the decay of the tubers, some of a more, others of a less satisfactory nature, but none of them capable of suggesting a preventative, and I am not aware that any such preventative has been yet brought to trial. But the disease was looked upon last year as in all probability of a transitory nature, and attention was directed more to the preservation of the tubers of that year, than to the prevention of the disease for the future. It was, of course, on the supposition that the disease was dependant on the growth of fungi, recommended that good tubers only should be planted in the ensuing spring, but beyond this, I believe nothing further was done. It has been stated that minute insects have been found on the leaves, which, by making numerous punctures, destroyed the vitality of those portions so injured, and thus caused the leaves to shrivel, and afforded a dead nidus for the vegetation of the Botrytis, which is very generally found on the decaying portions of the leaves. This may be true in some instances, but I have very carefully examined the leaves of potatoes affected with the disease, without being able to find any trace of such insects on the healthy or diseased portions of the leaves. If there had been any insects, these had long since disappeared, and left no marks that I could discover of their ravages. As to the excessively minute perforations in the cuticle, discoverable only by a high power of the microscope, which have been described, they might be either the result of the decay, or they might exist only in the imagination of the observer, or again they might be the result of want of practice in microscopic examinations. If the eminent observer Mirbel, described the ultimate tissues of plants as riddled with holes or slits, it may be easily believed that others less practised in the use of the microscope, should be led into similar errors. But in this instance we require that the insect should be found on the potato, that it should be accurately described, that it should be seen while occupied in its destructive vocation, and that it should be universally observable or observed. Until these conditions are fulfilled, we may be allowed to doubt whether this is to be recorded among the causes of the disease.

The connexion of certain fungi with the diseased state of the leaves and tubers of the plant is of much greater importance, inasmuch as the Botrytis is almost universally observable on the leaves of the diseased plant; and statements have been made that

other fungi have been found growing within the stem and tubers. We may therefore fairly say, that the development of fungi has a striking connexion with the premature decay of the tubers. But the question may be asked, Is this development of fungi the cause or the consequence of the disease? It requires for the elucidation of this point, that the general history and physiological relations of epiphytic fungi should be brought under review, and to this task I shall first proceed. We may for the present purpose divide the whole of the fungi into two classes, those that grow on dead animal or vegetable matter, and those which infest living plants. Of the former, those which grow on the common soil, generally spring up where this has been well manured by the decay of animal manure, of animals themselves, or on stumps of trees and other decaying vegetable substances. The latter consisting chiefly of the ordinary diseases of corn and other plants, belonging to the genera *Uredo*, *Æcidium*, *Puccinia*, *Aragma*, &c., are as evidently absorbed by the root, carried up by the stem, and finally develop themselves in various parts of the plants, according to their peculiar nature. These plants consist of simple cells containing spores, and, like the parasitical animals, may exist in the plant without causing much injury, except to the particular part which they infest, unless the parasite is developed in great abundance. Neither does the fungus cause the destruction of the vitality of the cells of the stem, or of the leaves, except those immediately occupied by it. Other genera of fungi, belonging to a different order, fix themselves on the leaves of plants, and are probably produced in the same way as those just noticed, namely, by the absorption of the spores by the roots, and their transit with the sap to the leaves, where they are developed. The genus *Dothidea* is an example, *Asteroma* another, but still these, although causing some unhealthy appearance in the leaves, do not cause that absolute death of the cells which is seen in the patches of the leaves in the potato disease.

Descending to the tribe Mucedines, we find that very few of these grow on living plants, and even when such is the case, they spring from previously diseased spots of the leaves; these spots become yellow, the cellules flaccid, and in a great measure deprived of vitality, before they afford a fit nidus for the development of the fungus. In the genus *Botrytis*, of which the fungus of the potato is a species, we have three species inhabiting still living but unhealthy plants, and this previous state of debility or diminution of vitality of the diseased plant, is especially observable in one of these cases. It is common to find the Shepherd's purse (*Thlaspi Bursa-pastoris*) covered

with the white Uredo (*Uredo candida*), and it is almost as common to find this again covered with the *Botrytis parasitica*, although the latter is sometimes present on plants free from the Uredo. In this case it is sufficiently evident that the vitality of the plant has been diminished by the growth of the Uredo before the *Botrytis* is able to fix itself upon it. Moreover, both these plants occur chiefly in the autumn, when the leaves are verging toward decay. The *Botrytis effusa*, which is a pest of spinach, and another species found on the *Chenopodium albidum*, occur on yellowish, half-decayed spots, or certainly spots in which the cellules of the leaf have lost their vital turgidity.

With this brief and imperfect outline of the habits of the parasitical fungi, I arrive at the consideration of the question,—is the *Botrytis* found on the potato leaf, a cause or, consequence of the disease? If we were to take the analogy of the Uredo, *Æcidium* and *Puccinia*, we should be inclined to imagine that the sporules of this *Botrytis* were absorbed by the roots, and carried with the sap to the parts in which they are ultimately developed; but this analogy does not appear to me to hold good, for reasons I shall presently detail. The Uredines occur, as I have stated above, in otherwise healthy plants, and provided they are not developed in very great abundance, the functions of the plants are but little disturbed. The Mucorines on the other hand seldom make their appearance except on decaying vegetable or animal matter, and even when they do so, the plant or the part of the plant on which they occur is usually if not invariably in an unhealthy state; the cells become more or less flaccid and the colour is changed to yellow or brown; they are indeed emphatically the inhabitants of putridity. In the plants of potato affected with this disease, I observed that the leaves became flaccid, either at their edges, or presented flaccid and half-dried spots in the areolæ of the veins of the leaves, which quickly changed to brown, and ultimately were crisped and curled, exactly such effects as I have seen to follow the immersion of the roots in some poisonous metallic solutions. The *Botrytis* was not to be found on all these spots; some were entirely free from it, while others were covered with the fungus. I shall presently have to insist more strongly on this circumstance. Where the *Botrytis* was found, on such spots it could not be traced beyond the flaccid and dying or dead portions of parenchyma, and gradually diminished in amount as it approached the margins of the spots. I need not describe the characters or appearance of the Botry-

tis as this has been ably done by Mr. Berkeley. Taking these circumstances into consideration, the absence of the fungus from some even of the recent spots, the fact that the Botrytis only appears on the dead, half-dead, or even decaying portions of the leaf, I think that I am justified in concluding that the Botrytis is not the cause, but the consequence of the death of some portion of the tissue of the leaf. It seems to me quite as rational to believe that the sporules of this fungus floating in the atmosphere affix themselves to the dying leaf, and finding thus a fitting nidus for their development, arrive at maturity, as to suppose that they are absorbed and carried by the juices to every part of the plant. It would be quite as rational to believe that the sporules of any of the common moulds, were circulated in the fluids of an animal whose flesh, after a few days' exposure to the atmosphere, is found to be covered by them. The experiments of Schultze have shewn that unless these sporules, which from their excessive minuteness float easily in and are diffused through the air, are admitted to animal, or vegetable substances undergoing decay, no development of Mucors or animalcules can occur. I conclude therefore that the appearance of the Botrytis is a secondary consequence of the disorganisation and loss of vitality of some portion of the cellular tissue of the leaf.

From the leaf itself we now proceed in a downward course to the petioles and stem, and here we find marks of disease. The petioles become brown, some portions retaining their normal or healthy appearance. The diseased parts are flaccid, more transparent and more watery than natural, but their sections do not show any appearance of fungus, or at least I have not been able to detect any traces of either mycelia or perfect fungi. The stem itself is subject to similar changes; but being more bulky and retaining its moisture longer, the color is deeper and becomes almost black; decay goes on, the cellular tissue of the pith is disintegrated or destroyed, and fungi are then said to be found in the hollow. In the field of potatoes I examined at Croydon some days since, I could not see any stems in this state, and I have since been favoured by my friend Mr. Cooper, with some of the most diseased stems that could be found in a field severely affected with the disease; but in these no appearance of fungus could be discovered. It is extremely probable that in a very advanced stage of decay, and perhaps later in the present season, such fungi will be found, as they will also on almost every decaying stem of an herbaceous plant. At all events I can affirm that so far as my inves-

tigations have gone, no fungus exists in the early stage of the disease.

We now arrive at the most important part of the plant in an economical point of view, that modification of the stem in which starch is so freely deposited, and which is thereby rendered fit for the food of man. Before we discuss the nature of the disease in the tuber, it is necessary to pass in review the structure of this part of the plant. The tuber, it is almost unnecessary to say, consists of a simple enlargement of the underground stem, by the enormous development of cellular tissue, containing an immense multitude of starch granules. Hence we may expect to find in it all the ordinary structures of the stem very much separated and as it were disturbed by the excessive development of the pith, but differing from the stem in the almost if not total absence of woody fibre. If we make a perpendicular section of the tuber and look at the cut surface, we see two lines diverging from the point of entrance of the stem, and which pass round the potato and meet again at its opposite extremity, where the underground stem was again continued of its ordinary size. These lines are indications of the woody tissue of the stem, the large circle they surround being the dilated and enormously developed cellular structure of the pith filled with starch granules. Along the central axis of the potato we observe a dull line, which only differs in its microscopic structure from the remainder of the cellular portion of the tuber, in perhaps containing fewer starch granules. This dull line marks the normal development of the pith in the ordinary stem. The epidermis is separated from the bundles resembling and continuous with the woody tissue, by a considerable interval filled up by similar cellules, filled with starch. The cells are for the most part of an hexagonal or pentagonal outline, and filled, or nearly so, with starch granules, except near the surface, where they are more compressed and contain less starch. The vascular bundles, which in a transverse section of the tuber form a circle, consist of barred or dotted ducts, with a very few spiral vessels, and surrounded by compressed or prismatic cellular tissue and little or no woody fibre. The walls of the cellular tissue are perfectly transparent, colourless and slightly granular, buds are developed on points of its outer surface; such is the condition of the tuber in its healthy state. I must more especially remark that nearly the whole of the cellules, except those immediately surrounding the vascular bundles, and beneath the epidermis, are filled with starch granules, which occupy the whole of the cavity, some few of the cells being less crowded with starch granules. When we examine

a thin slice of the potatoes affected with the disease where the decay is confined to minute spots, we see that the still uninjured parts are strikingly deficient in starch granules, and that the granules themselves are for the most part smaller and less perfectly formed. The decay commences in the walls of the cells which become, more or less brown and more coarsely granulated than in the healthy state of the tissue, and lose their transparency. The process of decay having thus commenced in the walls of a single cell, is propagated to the walls of the cells contiguous to it, and by this progressive decay a large portion of the tuber is ultimately involved in the disease. I have not been able to detect any fungus or mycelium of fungus in the tubers either of the last or the present year, and I would attribute the decay, not to the development of fungi, but to the same cause that gives rise to the decay in apples, and other fruits, the diminution or total loss of the vitality of the cell. That fungi are afterwards developed in the tubers as in any other dead vegetable matters, is indisputable, since they have been seen by such distinguished microscopical observers and mycologists as the Rev. M. J. Berkeley, and Mr. Stevens of Bristol; but that they are necessary concomitants to, or causes of, the disease, I feel inclined to deny, since in none that I have examined were they present, and as I used an achromatic microscope of such power as to make the larger starch granules appear a quarter of an inch in diameter, I think that I should have readily detected them, had they been present. It would not however be difficult to mistake the junctions of the hexagonal cells for the mycelia, as they put on somewhat the appearance of tubes; but as these are present in the perfectly healthy as well as in the diseased potato, they cannot be considered as mycelia.

On the supposition of the presence and direct influence of fungi in the production of decay, it would seem improbable that decay should take place to so great an extent as I have observed, without the full development of the fungus, which was not the case in the specimens I have examined. From all I have stated above I shall draw the conclusion that the production of fungi in the different parts of the potato plant, is the concomitant rather than the cause of the disease.

Let us now endeavour to trace the disease in a more systematic manner, and first of the causes which may bring about the disease. The tracing of chains of causation is at all times difficult, even when we have to deal with the more simple bodies of the inorganic kingdom, or even the materials of which organized beings are formed; but when a question arises in which the laws of vitality are involved,

we are presented with a more complex and difficult problem. As we descend in the scale of organised beings we find them more influenced by external causes, their growth, nutrition, and reproduction are influenced by causes, which possess no power over the similar functions of beings higher in the scale of creation. But even the highest are still more or less under the influence of external causes, some of which we have no power to explain, foresee, or prevent. At intervals we find countries ravaged by epidemic diseases, which do not appear to be contagious, and are probably dependent on meteorological causes. Many animals are seen in great abundance in certain years, disappearing and re-appearing at uncertain intervals. Locusts may be quoted as an example. But if such causes operate on animals, how much more may we expect that they should influence beings lower in the scale! We consequently find that our amounts of agricultural produce vary very considerably and are dependant on the amount of rain, dew, and other atmospheric causes. But this is more particularly the case with the lowest orders of vegetation—the fungi. These are often seen in large quantities one year, almost disappearing the next, and recurring in a periodical abundance.

What are the known causes of their variations? Why should epidemical disease, insects and fungi, thus observe an irregular periodicity in their abundance? Such circumstances lead us to the belief that they must depend on atmospheric influences; that variations in the density, in the humidity, in the electric state, or finally perhaps in the intensity of the earth's magnetism, are capable of influencing both animal and vegetable life, and of inducing diseased states of organized beings.

The variations of humidity, whether in the state of vapour or rain, have been recognised from time immemorial as causes of variations in the amount of agricultural produce, but the influence of electricity and magnetism, or even the changes of intensity of these powerful agents, have not been determined with any degree of accuracy. It is possible then, and I put it forward as an hypothetical statement, that these influences may have produced the death of some portions of the cellular tissue of the leaves. If we have a cause for the disease of the leaves we may readily account for the subsequent state of the stem and tuber. The leaves being the digestive as well as the respiratory organs of the plant, if these are extensively diseased or destroyed, two important functions will be deranged, or diminished, an insufficient, or unhealthy sap will be returned to the stem, and this will suffer in its turn. As the tuber is simply a cellular development or distension

of the stem, it will be injured in the same manner, but as both the structure and function of the tuber, differ from that of the remainder of the stem, some peculiarities will be observed.

The starch which fills and distends the cellules of the tuber, has been aptly compared with the fat of animals, and as it is sufficiently evident that it is deposited as a fund of nourishment to the young parts of plants, it performs precisely the same function in their economy. But the fat of the animal, or the starch of the plant, is only deposited when there is an excess of nutriment in the system; and it is to be expected that when there is a diminution of vitality, a disease of the digestive and respiratory organs and functions of the plant, that this deposit of nutritious matter will also be deficient or imperfectly developed. Now from the observations I have been able to make, I come to the conclusion that the starch granules are either deficient in number or bulk. On placing a slice of the diseased potato under the microscope, many cells are seen perfectly empty or containing only a few small granules, while in other cells they are more numerous but still of small size. Now as the cellular tissue is fully developed while the starch granules are deficient, their place is supplied with a watery juice, which renders the tissue more prone to decay. The decay as I have mentioned above commences in the cellular tissue, and spreads along the walls of the cells, rendering them brown and opaque.

I find that this paper has already grown to a greater length than I had at first intended. I could have wished to have entered more fully on the general conditions necessary to the healthy performance of the functions of a plant, the influence of atmospheric changes and other analogous subjects, but other avocations and want of time have prevented the fulfilment of my primary intention. I shall therefore content myself with suggesting a remedy for the disease in future crops. As there would appear to be defective vitality accompanied by growth of fungi in this disease, I would suggest the use of stimulating manures, such as common salt, or the chloride of potassium, or even any other alkaline salts, taking care of course to avoid too great a quantity, which would prove injurious to the plant.

P. B. AYRES.

12, Howland St., Fitzroy Square.

BOTANICAL SOCIETY OF LONDON.

Sept. 4, 1846. — Edward Doubleday, Esq., F.L.S., V.P., in the chair.

Donations to the library were announced from Dr. Cooke, Dr. Ayres, Dr. Palmer, Mr. G. Cooper, Mr. J. Reynolds, Mr. H. W. Martin, Mr. J. Freeman, Mr. J. Rich and Mr. G. Rich. British plants have been received from Mr. S. P. Woodward, Mr. Charles Prentice, Mr. Watkins, Mr. George Lawson, and Mr. J. Roby. Mr. Williamson, of Kew Gardens, presented specimens of an *Orobanche*, collected by him near Epsom, Surrey, and suggested to be *Orobanche lucorum* (of Braun), but perhaps rather an identical species with the *Orobanche elatior* (of Sutton). Its occurrence in clover fields, in which the specimens were collected by Mr. Williamson, is also in favour of this view. The specimens differ from the character given to *Orobanche lucorum*, in Koch's Synopsis, by having the sepals shorter than the tube of the corolla; but in other respects the dried specimens do not exhibit any decided difference from the characters of *Orobanche lucorum*, though corresponding as well with those of *Orobanche elatior*.

Dr. P. B. Ayres read a paper "On the Potato disease" (*Phytol.* ii. 632).— *G. E. D.*

List of the Rarer Plants found in the neighbourhood of Twycross, Leicestershire. By the REV. ANDREW BLOXAM, M.A.

Atriplex erecta. Corn-fields.

Calamagrostis epigejos. The park, Market Bosworth.

Callitriche pedunculata.

———— *β. sessilis.* In ponds on the Appleby road.

Cardamine impatiens. Hartshill Wood and Merevale, Warwickshire.

Carex binervis. Meadows.

———— *intermedia.* Do.

———— *pallescens.* Orton Wood.

———— *paniculata.* Pond at Netherseal.

———— *pilulifera.* Marshy ground on the Appleby road.

———— *pseudo-cyperus.* In ponds: rare.

———— *pulicaris.* With *pilulifera*.

———— *stellulata.* Do.

Carex strigosa. On the left, between Market Bosworth and Sutton, in the ditch bounding the park.

—— *vesicaria*. Pond at Netherseal.

Cerasus austera. Leighton, near the wharf, Market Bosworth.

—— *avium*. Gopsal Wood.

Ceratophyllum demersum. Pond at Lee Grange.

Chenopodium polyspermum. Gardens.

Crepis biennis. In great abundance in pasture fields at Norton ; also at Lee Grange.

Triodia decumbens. Heathy pastures.

Fedia dentata. Corn-fields.

Festuca gigantea. Gopsal Wood.

—— *lohiacea*. Pastures.

Genista anglica. Heathy pastures : rare.

Gymnadenia conopsea. Nailston Long Meadow.

Hieracium boreale. Between Sheepy and Atherstone.

—— *sabaudum*. Near Twycross.

—— *umbellatum*. Do.

Hippuris vulgaris. Ashby canal.

Inula conyza. Austrey Hill.

Juncus obtusiflorus. Ponds between Congerstone and Shakerstone.

Lactuca virosa. Between Twycross and Snarestone.

—— *muralis*. Oxton village.

Lamium incisum. Waste grounds.

Lathyrus sylvestris. Hedge between Market Bosworth and Sutton.

Myosurus minimus. Corn-field near Congerstone.

Myriophyllum alterniflorum. Ponds on the Appleby road about a mile from Twycross.

Enanthe Lachenalii. Near Sutton wharf.

—— *peucedanifolia*. Meadow between Sutton wharf and the Ambien Wood.

Parnassia palustris. Marshy ground near the Ambien Wood.

Peplis portula. Marshy ground on the Appleby road.

Picris hieracioides. On the road to Sheepy.

Polygonum Bistorta. Field near Little Twycross.

Populus tremula. In hedges.

Potamogeton gramineus. In ponds : rare.

—— *heterophyllum*. Moira Reservoir.

—— *lucens*. Ashby canal.

—— *rufescens*. Ponds at Harris Bridge, near Twycross.

- Potamogeton zosteræfolius.* Ashby canal.
Potentilla argentea. Near Polesworth.
Prunus insititia. In hedges.
Pyrus communis. In hedges on the glebe, Market Bosworth.
Ranunculus circinatus. Ashby canal.
 ——— *fluitans.* River Seme.
 ——— *parviflorus.* A bank in Newton village.
Rosa Sabini. In a field near Little Twycross.
 ——— *spinosissima,* On the road by Orton Wood.
 ——— *micrantha.* In hedges : common.
Rumex maritimus. Pond in the Old Park, Market Bosworth.
Sambucus ebulus. Road-side at Cadeby.
Samolus valerandi. Banks of river Seme.
Scirpus sylvaticus. Banks of river Seme.
 ——— *carinatus.* Ashby canal.
Sclerochloa distans. Near Congerstone.
Silaus pratensis. In meadows.
Sison amomum. In hedges.
Trifolium filiforme. On banks.
Ulex nanus. Between Twycross and Appleby.
Utricularia vulgaris. Ashby canal.
Veronica Buxbaumii. Corn-fields.
 ——— *polita.* Waste grounds.
Zannichellia palustris. In ponds.
Equisetum hyemale. In a long plantation on the left, between Measham and Ashby.
Aspidium Oreopteris. Ditches near Twycross.
Blechnum boreale. Do.

ANDREW BLOXAM.

Of Vital Beauty in Plants. Extracted from 'Modern Painters,' by a Graduate of Oxford.

"I PROCEED more particularly to examine the nature of that second kind of Beauty of which I spoke in the third chapter, as consisting in 'the appearance of felicitous fulfilment of function in living things.' I have already noticed the example of very pure and high typical beauty which is to be found in the lines and gradations of unsullied snow. If, passing to the edge of a sheet of it, upon the lower Alps, early in May, we find, as we are nearly sure to find, two or three little

round openings pierced in it, and through these emergent, a slender, pensive, fragile flower,* whose small, dark purple, fringed bell hangs down and shudders over the icy cleft that it has cloven, as if partly wondering at its own recent grave, and partly dying of very fatigue after its hard-won victory; we shall be, or we ought to be, moved by a totally different impression of loveliness from that which we receive among the dead ice and the idle clouds. There is now uttered to us a call for sympathy, now offered to us an image of moral purpose and achievement, which, however unconscious or senseless the creature may indeed be that so seems to call, cannot be heard without affection, nor contemplated without worship, by any of us whose heart is rightly tuned, or whose mind is clearly and surely sighted."—p. 84.

"As we pass from those beings of whose happiness and pain we are certain, to those in which it is doubtful or only seeming, as possibly in plants (though I would fain hold, if I might, 'the faith that every flower enjoys the air it breathes,' neither do I ever crush or gather one without some pain), yet our feeling for them has in it more of sympathy than of actual love, as receiving from them in delight far more than we can give; for love, I think, chiefly grows in giving, at least its essence is the desire of doing good, or giving happiness, and we cannot feel the desire of that which we cannot conceive, so that if we conceive not of a plant as capable of pleasure, we cannot desire to give it pleasure, that is, we cannot love it in the entire sense of the term. Nevertheless, the sympathy of every lofty and sensitive mind usually reaches so far as to the conception of life in the plant, and so to love, as with Shelly, of the sensitive plant, and Shakespeare always, as he has taught us in the sweet voices of Ophelia and Perdita, and Wordsworth always, as of the daffodils and the celandine.

'It doth not love the shower nor seek the cold.
This neither is its courage nor its choice,
But its necessity in being old.'

And so all other great poets (that is to say, great seers); nor do I believe that any mind, however rude, is without some slight perception or acknowledgment of joyousness in breathless things, as most certainly there are none but feel instinctive delight in the appearances of such enjoyment.

"For it is matter of easy demonstration, that setting the characters of typical beauty aside, the pleasure afforded by every organic form is in proportion to its appearance of healthy, vital energy; as in a

* *Soldanella alpina*.

rose-bush, setting aside all the considerations of gradated flushing of colour and fair folding of line, which it shares with the cloud or the snow-wreath, we find in and through all this, certain signs pleasant and acceptable as signs of life and enjoyment in the particular individual plant itself. Every leaf and stalk is seen to have a function, to be constantly exercising that function, and as it seems, solely for the good and enjoyment of the plant. It is true that reflection will show us that the plant is not living for itself alone, that its life is one of benefaction, that it gives as well as receives, but no sense of this whatsoever mingles with our perception of physical beauty in its forms. Those forms appear to be necessary to its health, the symmetry of its leaflets, the smoothness of its stalks, the vivid green of its shoots, are looked upon by us as signs of the plant's own happiness and perfection; they are useless to us, except as they give us pleasure in our sympathizing with that of the plant, and if we see a leaf withered, or shrunk, or worm-eaten, we say it is ugly, and feel it to be most painful, not because it hurts *us*, but because it seems to hurt the plant, and conveys to us an idea of pain and disease and failure of life in *it*.

"That the amount of pleasure we receive is in exact proportion to the appearance of vigour and sensibility in the plant, is easily proved by observing the effect of those which show the evidences of it in the least degree, as, for instance, any of the Cacti not in flower. Their masses are heavy and simple, their growth slow, their various parts jointed on one to another as if they were buckled or pinned together, instead of growing out of each other (note the singular imposition in many of them, the prickly pear, for instance, of the fruit upon the body of the plant, so that it looks like a swelling or disease), and often farther opposed by harsh truncations of line, as in the *Cactus truncato-phylla*. All these circumstances so concur to deprive the plant of vital evidences, that we receive from it more sense of pain than of beauty; and yet even here, the sharpness of the angles, the symmetrical order and strength of the spines, the fresh and even colour of the body, are looked for earnestly as signs of healthy condition, our pain is increased by their absence, and indefinitely increased if blotches, and other appearances of bruise and decay interfere with that little life which the plant seems to possess."—p. 86.

"Now I wish particularly to impress upon the reader, that all these sensations of beauty in the plant arise from our unselfish sympathy with its happiness, and not from any view of the qualities in it which may bring good to us, nor even from our acknowledgment, is it of

any moral condition beyond that of mere felicity ; for such an acknowledgment belongs to the second operation of the theoretic faculty, and not to the sympathetic part which we are at present examining ; so that we even find that in this respect, the moment we begin to look upon any creature as subordinate to some purpose out of itself, some of the sense of organic beauty is lost. Thus, when we are told that the leaves of a plant are occupied in decomposing carbonic acid, and preparing oxygen for us, we begin to look upon it with some such indifference as upon a gasometer. It has become a machine ; some of our sense of its happiness has gone ; its emanation of inherent life is no longer pure. The bending trunk, waving to and fro in the wind above the waterfall, is beautiful because it is happy, though it is perfectly useless to us. The same trunk, hewn down and thrown across the stream, has lost its beauty. It serves as a bridge, — it has become useful ; it lives not for itself, and its beauty is gone, or what it retains is purely typical, dependent on its lines and colours, not on its functions. Saw it into planks, and though now adapted to become permanently useful, its whole beauty is lost for ever, or to be regained only in part when decay and ruin shall have withdrawn it again from use, and left it to receive from the hand of Nature the velvet moss and varied lichen, which may again suggest ideas of inherent happiness, and tint its mouldering sides with hues of life.

“There is something, I think, peculiarly beautiful and instructive in this unselfishness of the theoretic faculty, and in its abhorrence of all utility which is based on the pain or destruction of any creature, for in such ministering to each other as is consistent with the essence and energy of both each takes delight, as in the clothing of the rock by the herbage, and the feeding of the herbage by the stream.”—p. 88.

“Of the parallel effects of expression upon plants there is little to be noted, as the mere naming of the subject cannot but bring countless illustrations to the mind of every reader : only this, that, as we saw they were less susceptible of our sympathetic love, owing to the the absence in them of capability of enjoyment, so they are less open to the affections based upon the expression of moral virtue, owing to their want of volition ; so that even on those of them which are deadly and unkind, we look not without pleasure, the more, because this their evil operation cannot be by them outwardly expressed, but only by us empirically known ; so that of the outward seemings and expressions of plants, there are few but are in some way good, and therefore beautiful ; as of humility and modesty, and love of places

and things, in the reaching out of their arms and clasping of their tendrils ; and energy of resistance, and patience of suffering, and beneficence one toward another in shade and protection, and to us also in scents and fruits (for of their healing virtues, however important to us, there is no more outward sense nor seeming than of their properties mortal or dangerous).”—p. 94.

“ Let us next observe the conditions of ideality in vegetables. Out of a large number of primroses or violets, I apprehend that, although one or two might be larger than all the rest, the greater part would be very sufficient primroses and violets. And that we could by no study nor combination of violets, conceive of a better violet than many in the bed. And so generally of the blossoms and separate members of all vegetables.

“ But among the entire forms of the complex vegetables, as of oak trees, for instance, there exists very large and constant difference, some being what we hold to be fine oaks, as in parks, and places where they are taken care of, and have their own way, and some are but poor and mean oaks, which have had none to take care of them, but have been obliged to maintain themselves.

“ That which we have to determine is, whether ideality be predicable of the fine oaks only, or whether the poor and mean oaks also may be considered as ideal, that is, coming up to the conditions of oak, and the general notion of oak.

“ Now there is this difference between the positions held in creation by animals and plants, and thence in the dispositions, with which we regard them ; that the animals being for the most part locomotive, are capable both of living where they choose, and of obtaining what food they want, and of fulfilling all the conditions necessary to their health and perfection, for which reason they are answerable for such health and perfection and we should be displeased and hurt if we did not find it in one individual as well as another.

“ But the case is evidently different with plants. They are intended fixedly to occupy many places comparatively unfit for them, and to fill up all the spaces where greenness and coolness, and ornament, and oxygen are wanted, and that with very little reference to their comfort or convenience. Now it would be hard upon the plant if, after being tied to a particular spot, where it is indeed much wanted, and is a great blessing, but where it has enough to do to live, whence it cannot move to obtain what it wants or likes, but must stretch its unfortunate arms here and there for bare breath and light, and split its way among rocks and grope for sustenance in unkindly soil ; it

would be hard upon the plant, I say, if under all these disadvantages it were made answerable for its appearance, and found fault with because it was not a fine plant of the kind. And so we find it ordained that in order that no unkind comparisons may be drawn between one and another, there are not appointed to plants the fixed number, position, and proportion of members which are ordained in animals (and any variation from which in these is unpardonable), but a continually varying number and position, even among the more freely growing examples, admitting therefore all kinds of license to those which have enemies to contend with, and that without in any way detracting from their dignity and perfection.

"So then there is in trees no perfect form which can be fixed upon or reasoned out as ideal, but that is always an ideal oak which, however poverty-stricken, or hunger-pinched, or tempest-tortured, is yet seen to have done, under its appointed circumstances, all that could be expected of oak.

"The ideal therefore of the park oak is that to which I alluded in the conclusion of the former part of this work, full size, united terminated curve, equal and symmetrical range of branches on each side. The ideal of the mountain oak may be anything, twisting, and leaning, shattered and rock-encumbered, so only that amidst all its misfortunes, it maintain the dignity of oak; and, indeed, I look upon this kind of tree as more ideal than the other, in so far as by its efforts and struggles, more of its nature, enduring power, patience in waiting for, and ingenuity in obtaining what it wants, is brought out, and so more of the expanse of the oak exhibited, than under more fortunate conditions.

"And herein, then, we at last find the cause of that fact which we have twice already noted that the exalted or seemingly improved conditions whether of plant or animal, induced by human interference, is not the true and artistical ideal of it.* It has been well shown by Dr. Herbert, that many plants are found alone on a certain soil or subsoil in a wild state, not because such soil is favourable to them, but because they alone are capable of existing on it, and because all dangerous rivals are by its inhospitality re-

"* I speak not here of those conditions of vegetation which have especial reference to man, as of seeds and fruits, whose sweetness and farina seem in great measure given, not for the plant's sake, but for his, and to which therefore the interruption in the harmony of creation of which he was the cause is extended; and their sweetness and larger measure of good to be obtained only by his redeeming labour. His curse has fallen on the corn and the vine, and the wild barley misses of its fulness, that he may eat bread by the sweat of his brow."

moved. Now if we withdraw the plant from this position, which it hardly endures, and supply it with the earth, and maintain about it the temperature that it delights in, withdrawing from it at the same time all rivals which, in such conditions nature would have thrust upon it, we shall indeed obtain a magnificently developed example of the plant, colossal in size, and splendid in organization, but we shall utterly lose in it that moral ideal which is dependent on its right fulfilment of its appointed functions. It was intended and created by the Deity for the covering of those lonely spots where no other plant could live; it has been thereto endowed with courage, and strength, and capacities of endurance unequalled; its character and glory are not therefore in the gluttonous and idle feeling of its own over luxuriance, at the expense of other creatures utterly destroyed and rooted out for its good alone, but in its right doing of its hard duty, and forward climbing into those spots of forlorn hope where it alone can bear witness to the kindness and presence of the Spirit that cutteth out rivers among the rocks, as it covers the valleys with corn: and there, in its vanward place, and only there where nothing is withdrawn for it, nor hurt by it, and where nothing can take part of its honour, nor usurp its throne, are its strength, and fairness, and price, and goodness in the sight of God, to be truly esteemed.

"The first time that I saw the *Sondanella alpina*, before spoken of, it was growing of magnificent size, on a sunny Alpine pasture, among bleating of sheep, and lowing of cattle, associated with a profusion of *Geum montanum*, and *Ranunculus pyrenæus*. I noticed it only because new to me, nor perceived any peculiar beauty in its cloven flower. Some days after I found it alone, among the rack of the higher clouds, and howling of glacier winds, and, as I described it, piercing through an edge of avalanche, which in its retiring half left the new ground brown and lifeless, and as if burned by recent fire; the plant was poor and feeble, and seemingly exhausted with its efforts, but it was then that I comprehended its ideal character, and saw its noble function and order of glory among the constellations of the earth.

"The *Ranunculus glacialis* might perhaps by cultivation be blanched from its wan and corpse-like paleness to purer white, and won to more branched and lofty development of its ragged leaves. But the ideal of the plant is to be found only in the last, loose stones of the moraine, alone there; wet with the cold unkindly drip of the glacier water, and trembling as the loose and steep dust to which it clings yields ever and anon, and shudders and crumbles away from about its root."—p. 100.

On the Botany of the neighbourhood of Ross.

By WM. HY. PURCHAS, Esq.

THE face of the country in this part of Herefordshire is considerably diversified, and hence the local Flora is more varied and extensive than in many parts of England. Of the truth of this remark I leave your readers to judge from the appended list of plants growing in the district six miles on each side of the town. From this list such plants as are of universal occurrence are, of course, excluded, while many are retained, not on account of their rarity, but because, from their preference of peculiar situations, the statement of the frequency or rarity in which they occur will give a general idea of the Botany of the neighbourhood.

The general dependence of the Flora of a district upon the geological formation, receives a striking illustration at Coldwell (about seven miles from hence), where the mountain limestone appears for a short distance forming some fine rocks, and separated only by the river, there fifty or sixty yards wide, from the old red sandstone, the general formation of the county. On the side of the river where the last-mentioned stratum is found, the plants are the usual ones of the neighbourhood, but immediately on crossing, *Hypericum montanum*, *Origanum vulgare*, *Ophrys muscifera* and *apifera*, *Helianthemum vulgare*, *Prunus Aria*, *Prenanthes muralis* and *Polypodium Dryopteris*, make their appearance; the last-mentioned forming large beds on the heaps of débris at the foot of the rocks.

Thalictrum flavum. Banks of the Wye.

Anemone nemorosa. Abundant in every wood.

Berberis vulgaris. Sparingly on Copped Wood Hill.

Cheiranthus fruticulosus. Only on rocks at the entrance of the town. Probably escaped from cultivated ground above.

Cardamine impatiens. Abundant in a rocky, recently cleared, portion of the Chase Wood and at Coldwell.

Sinapis tenuifolia.* Sparingly on sandstone rocks near the town.

Thlaspi arvense. Plentiful in several fields.

Viola hirta. In one station only, near Kyrle's Walk.

Dianthus Armeria. One field only, near Penyard.

Saponaria officinalis. Waste ground near road-sides: not very general.

Hypericum Androsæmum. Woods, but not common.

* Now extinct.

- Hypericum dubium*. Not common.
 ——— *humifusum*. Copped Wood Hill, &c.
 ——— *quadrangulum*. Not uncommon by the side of ditches.
 ——— *montanum*. Coldwell rocks.
 ——— *hirsutum*. Dry woods.
 ——— *elodes*. Boggy stream, near Broadmead.
Geranium columbinum. Road-side, near Peterstow.
 ——— *pratense*. River side; rare.
 ——— *rotundifolium*. Waste places, fields, &c.
 ——— *dissectum*. Banks, waste ground.
Vicia sylvatica. Shady parts of Penyard Park Wood.
Pyrus Aria. Coldwell rocks.
 ——— *torminalis*. Chase Wood: rare.
Rubus leucostachys. Common in hedges near woods.
 ——— *Kœhleri*. Hedges near woods and road-sides.
Sanguisorba officinalis. Confined to one pasture near Backney, where it has grown beautifully for some years.
Alchemilla vulgaris. Pastures near woods; seldom in the same station for two successive years.
 ——— *arvensis*. Very common.
Epilobium roseum. In the town, under damp walls: common.
Cotyledon Umbilicus. Sparingly on rocks near the town.
Ribes alpinum. Hedge near Whitchurch, and Coldwell.
Saxifraga granulata. Kyrle's Walk.
Sison Amomum. Hedges, waste places, &c.
Oenanthe Phellandrium. Pools.
Anthriscus Cerefolium. Rubbish near the town.
Viscum album. Apple and poplar (black): abundant.
Sambucus Ebulus. Road-side beyond Pool-mill.
Fedia dentata. Corn-fields, Backney.
 ——— *olitoria*. Banks: not common.
Dipsacus pilosus. Sides of ditches, woody places, &c.: not common.
Scabiosa succisa. Grassy places in woods, heathy pastures, never in rich pastures.
Carlina vulgaris. Dry banks.
Bidens tripartita. Ditches, not common.
Erigeron acris. Hilly places.
Senecio sylvaticus. Open places in the Chase Wood.
Achillea Ptarmica. Banks of the Wye.

Campanula patula. Along with Cardamine impatiens in the Chase Wood: abundant.

——— *Rapunculus*. Pastures.

——— *latifolia*. Near Goodrich Castle.

——— *hybrida*. Corn-fields.

Monotropa Hypopitys. Woods: rare.

Menyanthes trifoliata. Ailmarsh and Coughton Marsh; never found in flower after the middle of May.

Gentiana campestris. Copped Wood and Doward Hills.

Chlora perfoliata. Symon's Yatt.

Cuscuta Epilinum. Occurred October, 1844, in a garden, on flax.

Echium vulgare. Fownhope and near Goodrich Ferry.

Myosotis collina. Hedge-banks.

Lithospermum officinale. Waste places, borders of woods, &c.

Lysimachia vulgaris. Banks of the Wye.

——— *Nummularia*. Wet places: damp woods.

Solanum Dulcamara. Very common in hedges. In May, 1844, a variety occurred having white flowers and downy stems and leaves, the latter with a strong, musky scent.

Nepeta cataria. Hedges.

Scutellaria minor. Bog on Howle Hill.

Pedicularis palustris. Muddy bogs in Ailmarsh.

——— *sylvatica*. Clayey pastures.

Scrophularia nodosa. Moist places, woods.

——— *aquatica*. Sides of brooks and ditches.

Antirrhinum Orontium. Corn-field, with *Fedia dentata*.

Pinguicula vulgaris. In Coughton Marsh only, and confined to a very boggy part.

Typha latifolia. Pools: not frequent.

Paris quadrifolia. Penyard Park Wood: one station.

Ornithogalum nutans. Hedges: not general.

Colchicum autumnale. Barren meadows.

Epipactis latifolia. Shady parts of the Chase Wood.

——— *grandiflora*. Wood between Huntsholm and Symond's Yatt.

Ophrys muscifera. Coldwell.

——— *apifera*. Coldwell.

Habenaria bifolia, *β.* Hook. 'Br. Flora.' Merryvale Wood. In some seasons plentiful, in others rare.

Neottia spiralis. Old, hilly pastures about Hoarwithy and Howle Hill: uncertain, like the preceding.

Listera Nidus-avis. Penyard Park and Chase Woods: rare.

Lemna gibba. Pools: flowering and fruiting abundantly in a still pool, July and August, 1846, but not in a slow stream, where it abounds.

——— *polyrhiza.* Pool near the town.

Festuca elatior. Between Huntsholm and Symons's Yatt.

Brachypodium sylvaticum. Hedges: not common.

Carex muricata. Banks.

——— *divulsa.* Banks.

——— *vulpina.* Ditches.

——— *flava.* Marshes.

——— *recurva.* Covering some acres of ground in Ailmarsh, sometimes flowering early in the year, when the fertile spikes are almost sessile, and the whole plant dwarf; also on sunny banks in a loamy soil.

——— *præcox.* Hedge-banks.

——— *ampullacea.* Ailmarsh.

Arum maculatum. Under trees in lanes, &c.

Polypodium Dryopteris. Coldwell rocks; also in shady parts of Penyard, where its habit is very delicate, and little fruit produced: the frond of a slightly glaucous hue.

Grammitis Ceterach. Very sparingly.

Asplenium Adiantum-nigrum.

Scolopendrium vulgare.

Ophioglossum vulgatum. Sparingly on Howle Hill; plentiful in some fields near Upton Bishop.

W. H. PURCHAS.

Ross, Herefordshire,

September 11, 1846.

Effects of Agitation and Rest upon Plants submerged in Water.

Communicated by MR. WARD to the Linnean Society.

"MR. WARD exhibited specimens of the the extreme states of *Chondrus crispus* (*Lingb.*), gathered by him at Linmouth, N. Devon, growing within a few feet of each other, but under different conditions; the broad variety being found in pools among the rocks, where it is always submersed, the narrow on the outer ledge of rocks, where it is fully exposed to the action of the waves, which produce the same

effect upon it as is frequently observed in fresh-water aquatics, the submersed leaves of which become more or less finely divided in proportion to the greater or less rapidity of the stream. It is worthy of remark, that the broad state, which is found in comparatively still water, is wholly free from zoophytes, while the narrow is entirely coated with them."—*Proceedings of the Linnean Society*, 1846, p. 283.

The Potato Mania. By the EDITOR.

WE never recollect a subject that drew forth such a cloud of authors as the failure of the potato crop: not only every botanist, but every agriculturalist, every gardener, every political economist has rushed in a kind of poetic frenzy to his inkstand, and hastened to the printing office with the results. Long unmeaning papers, that on any other subject would not have been tolerated for a moment, have on this fashionable topic been read with patience and even delight, and we verily believe that nothing could be written so absurd, as not to command attention and respect. The poor starving Irishman, with 7d. for his day's wages, has been seriously recommended to erect buildings and apparatus for slicing, drying and grinding into flour, the produce of his rood of potatoes; and this, bitter and cruel as the jest may seem to the reflecting mind, has been sent forth with authority. In fact nothing has been deemed too outrageous to recommend; and those who would scarcely know a potato from a turnip, in the field or storehouse, have taken a distinguished lead in suggesting alterations in the mode of cultivation and storing.

There can be no doubt that this unparalleled mania for writing on the subject, has produced a greatly exaggerated idea of the calamity. The writer of these observations is a householder, and has many mouths to feed; potatoes are required in some abundance; his own eating takes place at a variety of places, but no day passes without a demand for potatoes, nor without the demand being abundantly supplied. Now whether as regards the cost as an item of housekeeping, or the quantity supplied wherever he may happen to dine, or the quality of the potatoes set before him, he has never in any instance perceived indications of scarcity or inferiority, and the fact of the existence of scarcity or inferiority is unknown to him, except through the medium of the printing-press: and yet there is no doubt that, at the present moment, the price of the potato is driven up to the highest pitch to which speculation, founded on the newspaper reports, can possibly force it.

If therefore this universal mania for writing on the subject, and this boundless love of speculation, produce no effects that he can feel, may he not reasonably hope that the calamity is not so enormous as the public has been led to suppose? — may he not hope that it is one which by prudence, judgment, and above all by experiment, may yet be averted from those whom it seems more particularly to threaten?

We happen to possess that peculiar temperament that is more influenced by precise facts than by superlative expressions: thus, if the parish of Littleton produced 20,000 tons of potatoes in 1844, 18,000 in 1845, and 16,000 in 1846, we should have facts to comment on; and if a thousand parishes taken together exhibited an equal decrease, it would become still more serious, and calculations might be made with still greater precision: but no one seems to aim at obtaining or disseminating such information as this. If the facts of the case were as we have stated, we should find them set forth in these terms, "horrible famine in Littleton, total failure of the potato crop." Living in Littleton we should know this statement to be false, and should therefore doubt the truth of any similar statements. Let us come to tons, hundred-weights, quarters and pounds, or to pounds, shillings and pence, anything intelligible, but vague poetical statements, albeit clothed in forcible language, have little weight with the lovers of facts.

That there is disease, and consequently deficiency, it is impossible to doubt; the statements cannot be altogether false; but there is so much exaggeration, so great a love of the marvellous, that it requires a very sound judgment, and no small portion of labour, to separate the real from the ideal, truth from fiction.

After taking the preliminary step of ascertaining with something approaching to precision the real amount of the injury, the next would be to publish the result, and thus defeat, as far as practicable, the interested designs of speculators, and at the same time allay the fears which had been raised by fictitious or exaggerated statements. It is to be feared that no information can be gained as to the cause of the disease, at least the labours of botanists have failed in achieving this most desirable object. Nevertheless we may consider the question of mitigation or cure, which, in the absence of all knowledge of the complaint is certainly a difficult one, nor do I know any other resource than experiment, and here we have been woefully deficient. Instead of the innumerable and elaborately detailed suggestions and recommendations as to different modes of treatment, the very penning of which must have been a work of prodigious labour, the recommenders

should have quietly and unostentatiously devoted themselves to experimenting on the plant itself; tried different modes of earthing up; different degrees of drought and moisture; varied exposure to light and shade; variety of soil and manure; different periods of planting; different periods of digging; different distances in planting, both as regards the individuals and the rows; different modes of preparing the cuttings, and indeed a thousand departures from the usual routine mode of cultivation. It is hardly possible that many trials of this kind could be made without *some* result; and the publication of the results would be infinitely more acceptable than a host of recommendations in which experience has had no part.

There is another matter which should have its weight, and consequently its consolation, with all reflecting minds, and that is the extreme improbability of the disease continuing to exist: whether resulting from atmospheric agency, the coldness of the summer of 1845, the dryness and heat of the summer of 1846, the presence of fungi, the depredations of insects, the Maynooth grant or the repeal of the corn-laws, which seven causes have been urged with serious and unhesitating faith in their validity, we must not anticipate a continuance of what is so great a departure from the usual course of nature. The atmospheric conditions may be changed, the fungi may disappear, the insects may die, a no-popery government may refuse Maynooth grants, and Lord George Bentinck may be Prime Minister, and give us new corn-laws: in fine if we refer to precedent we shall find it abundantly in the history of the past. Blights, murrains, diseases of man, of beasts, of plants, have repeatedly occurred, have passed away, and would be forgotten were it not for the records that have been preserved: on one occasion the hedges were stripped of their leaves by the devastation of a caterpillar (*Arctia chrysorrhœa*), and on the same occasion a multiplicity of natural and political causes was found; some very pious persons firmly believed the devastation attributable to the general establishment of Lancasterian schools: then we have had plague, cholera, failure of wheat, turnips and hops, but a time of health and plenty has always returned, and will again. Whatever be the amount of the disease—and far be it from us to doubt its existence—let us meet it like men: let us coolly ascertain the worst, and having possessed ourselves of this knowledge, let those who are really practical men make the experiments we have suggested and report the result, and let all the rest, the fine writers, the essayists, the religionists, the politicians, turn their attention from causes to effects, ascertain the distress which an increased price of potatoes may cause among their poorer neighbours, and then, putting

their hands in their pockets, furnish them with the means of buying bread instead. Let the leading papers give their thousand pounds each, let Dr. Buckland give his thousand pounds, and all the minor actors, on the potato-stage, sums in proportion to their essays and orations: this is the way to meet the evil and to rejoice the hearts of the sufferers.

These observations may perhaps be allowed to serve as an introduction to the following sensible paragraphs which appear as the leading article in last week's 'Gardener's Chronicle' a paper which has however devoted far too much space to the 'notoriety seeking' scribes on this hackneyed subject to be excused from a liberal contribution to the general fund.

"Last year, wherever the tops of the POTATOES were blighted, the tubers were also, invariably, decayed. We are not aware of any example to the contrary. This year it is not so. We have ourselves seen Potato fields with all the tops blighted, and yet the crop, a very scanty one, was either free from disease, or inconsiderably affected. Our Paris correspondent, of last week, spoke to the same fact. Near Hythe, in Kent, the crop is better than last year, both in quantity and quality, although the plants were blighted; and we know that the circumstance is by no means uncommon. In other cases a second crop of small tubers is forming; so that great as the mischief no doubt is, yet it is much less than last year in some places. What does this mean? Of course such a fact may be taken to signify that the atmosphere was the vehicle by which disease was communicated to the tuber; and that in these instances the atmospheric influence, whatever it may be, which has swept over the face of the country, was resisted by the vigour of the Potato crop.

"Some weeks ago a correspondent mentioned a report that the Potato crops, within the influence of the smoke from the copper works round Swansea, were saved from the blight, although the crops perished beyond the circle of their influence. It was also asserted in the *Cam-brian* newspaper, that:—

"Last year the Potatoes reared in the neighbourhood of the copper works turned out to be healthy, and that in the present season the fact is still more determined. While in Sketty, Langyfelach, and all around, the Potatoes are universally diseased, it so happens that in the immediate vicinity of the smoke they are sound and healthy, with scarcely a trace of disease to be found in them.'

"This has been contradicted. But we are now in a condition to show that the statement alluded to was true. The following letter

from a resident near Swansea sets the question at rest, by proving that the copper smoke does protect the Potato crop, and effectually !

“On the 31st Aug., I examined many pieces of Potatoes within the immediate influence of the copper smoke from the smelting works in this neighbourhood. There is no occasion perhaps to note the individual cases, but the general result is that the leaves, haulm, and tubers, improve as you approach the works, and that the nearest gardens, little more than 200 yards from them, are entirely free from the blight, and the crop good in quality, quantity, and flavour. The Potatoes are of different sorts. These last-named gardens, as I am informed by the proprietor, entirely escaped the disease in 1845, and have borne Potatoes for 40 years. The Potatoes are also said to have escaped in the vicinity of the chemical works at Newcastle. As a kindred misfortune, I may mention that a disease producing rottenness, occurs in many instances here in the white Turnip, and it is to be feared that its earliest stage is perceptible in the Swedes.—*Matthew Moggridge, the Willows, Swansea, Sep. 4.*’

“Here it may be urged by the advocates of atmospheric contagion, that one miasm has had the power of repelling another from the Potato field.

“In former numbers we have given other instances of a similar kind, though far less striking,; such as Potatoes under the shelter of trees, or of a mixed crop, or of hedgerows, having also been saved. These also point to atmospheric influence. Mr. NEVIN, in his very valuable pamphlet,* adopts the atmospheric theory without hesitation. Nevertheless, we are as unable as ever to reconcile this theory with the whole of the facts known to us. We are indebted to Mr. BECK, of Isleworth, for the following observation, which bears directly upon the present question:—

“I had a small piece of Ash-leaved Kidneys, which ripened off a healthy yellow colour, and so died down to the ground without a speck of the disease. There was not a speck of it on any of the tubers we cooked. There was no appearance on the portion I had saved for seed, and which was laid out for greening. But on Saturday last (Sept. 12), I was surprised to find that a considerable portion of the whole quantity (about a bushel) was greatly affected. The whole mischief had been done in a few days; for we were about to put them away the early part of the week, but thought a few days longer exposure would be better. I had no other Potatoes in my garden, nor are there any near me. I am surrounded on three sides with high

* ‘*The Potato Epidemic, and its probable Consequences.*’

walls; on the fourth, a high Quickset hedge and Grass field form the boundary.'

"We have ourselves a somewhat similar case, with a new variety, called "Willison's seedling," the offspring, no doubt, of the Ash-leaved Kidney. It grew, remained healthy, and ripened without a trace of disease. When taken up, the tubers were absolutely sound. They were laid by in a dry shed, well covered with mats, and in a few weeks symptoms of disease, slight ones, made their appearance in the tubers. Similar instances occurred last year with sound Potatoes that were attacked in sand, kept constantly in a dry place, and that never formed tops. These are apparently irreconcilable with atmospheric agency, whether miasm, or anything else, unless it is assumed that the supposed disease acts *directly* upon the Potato.

"Even the curious state of the Tomato crop in some places, although at first sight favouring the opinion, seems to be, on the whole, irreconcilable with it. This fruit has this year been extensively injured in the country round London, by a rot, which attacks the ripening Apple, and renders it unfit for use. Sometimes the leaves are blotched, sometimes not. It is evidently, we think, the same as the disease of the Potato 'Apple,' or fruit, and in both cases is, as far as we have seen, unaccompanied by fungi. It appears on the exposed side, where the fruit receives the most air; and therefore, it may be said, is attacked by something in the atmosphere. But there is this difficulty in the way of admitting such an explanation: the supposed miasm ought to attack all Tomatoes in the neighbourhood of tainted Potato fields; but it does not. Our excellent correspondent "Quercus," than whom there is not a more close, shrewd, practical observer, finds no such disease in his Tomatoes; and we have lately seen beautiful samples of this fruit in the market of Boulogne, all round which place the Potato crops are blighted. The French peasants had not even heard of the Tomatoes being attacked. We respectfully present these facts to the consideration of those who are striving to find out the CAUSE of the Potato disease. They not only must not be neglected, but no theory can be accepted which fails to include them in its scope. One thing, however, they seem to dispose of conclusively, and that is the notion that the potato disease is to be kept off by regeneration from seed. Tomatoes are annually regenerated from seed, and Tomatoes suffer like Potatoes."

In many of these remarks our readers will perceive that there is much good sense: the idea of appealing to facts is sound, and possesses in a great degree the additional charm of novelty: it is a move in the right direction, and will be respected by all right-minded readers.

We cannot conclude these observations better than with the report published in the 'Athenæum,' of the doings of the British Association on this absorbing subject ; the opinions expressed by the *savans* are somewhat too varied to be generally received ; but we think Dr. LANKESTER's concluding remark, though somewhat uncomplimentary to the Association, will receive universal assent : we have italicised the remark to which we allude.

Mr. W. HOGAN read a paper 'On Potatoes raised from Seed, as a means of preventing the extension of the prevailing disease.'—He first read extracts from German publications, giving the result of the trial of growing potatoes from the seed of the plant, which had been found to be successful as far as the production of tubers, and also the preventing the prevailing disease. Mr. Hogan had also tried the same process with success. The proceeding consisted in growing the seeds first in a hot-bed, and then transplanting. He considered this to be a successful way, because the most natural.

Mr. M. STIRLING stated that he had, some time since, recommended to the Government of Sweden the plan of procuring the potato seed, and deriving thence the crops. He had advised giving prizes for the best seedling potatoes, and he also recommended hybridizing the potato, as a means of improvement.—Mr. W. OGILBY thought growing potatoes from the seeds might prevent the scurf and dry rot, but not the present wet rot of the potato. He quoted several instances in which seedling crops had been destroyed. He had been most successful in growing potatoes from a little tuber which sprung from the "eyes" of the old ones going to decay.—Dr. CROOK attributed the attack in the year 1845 to "cold." The cold burst the vessels ; and then came the disease. Heat produces the same effects as cold ; it bursts the tissues of the vessels, and the consequence is disease.—Dr. DAUBENY did not think that atmospheric changes had anything to do with the disease at all. He thought that the most satisfactory theory was that which referred the disease to fungi. He had understood that there was no potato disease in the neighbourhood of the copper furnaces in Swansea.—Dr. BUCKLAND had lately visited Prof. Payen, who advocated the doctrine that the disease arose from fungi ; and he (Dr. Buckland) believed so too. There was, in fact, a fungiferous miasm existing, which, like cholera, attacked not all, but those who were pre-disposed. It was the weak and intemperate that were attacked with cholera ; it was the debilitated potato that had the disease. Extreme conditions of temperature debilitated the potato, and then it became diseased. The potatoes were suddenly attacked. He

knew a case in which a whole field became diseased in three days. He believed the only remedy was mowing down the haulm of the potato the moment it was attacked.—Prof. L. PLAYFAIR was certain of one thing,—and that was, that the disease was not due to fungi. The nature of it was evident, as it could be produced artificially. If you scraped a potato and placed it in the open air it became diseased ;—and, in the course of a few hours, the fungi would appear on it.—Mr. E. SOLLY believed that the disease depended on chemical changes, not on the attack of the fungus.—Mr. BUSH had examined the diseased potatoes under the microscope, and in its early stages had always failed to discover the slightest indication of the existence of a fungus. As the disease advances, first one fungus appears, and then another,—and at last animal life. This was the progress of all vegetative decay. The disease always commences on the outside of the potato, and proceeds to the centre. He had always found the disease constantly attended with the development of crystals of oxalate of lime.—Prof. BALFOUR stated that some fungi attacked living and healthy structures,—others only diseased ones. The fungus of the potato was a *Botrytis* which he believed attacked healthy structures.—Mr. A. STRICKLAND said, in reference to Dr. Buckland's recommendation to mow down the potatoes, that, when his neighbours mowed down their potatoes, he dug his up. They had lost nearly all theirs, whilst he had saved nearly all his.—Dr. LANKESTER observed on the want of evidence to support the theories of either cause or remedies that had been brought forward. Cold and heat had been assigned as causes, by destroying the tissues of the potato ; but no destroyed tissues had been shown to exist. Debility had also been supposed to exist ; but no proof was given of the existence of debility ;—and the Dean of Westminster himself had admitted that he had seen the healthiest potatoes destroyed in three days. Positive observation was evidently opposed to the fungus theory. As to the remedies recommended, seedlings had been known to be attacked in more cases than they had escaped ; and, therefore, sowing the seeds could not be recommended. Mowing down the stalks had not been more successful than letting them alone ;—and *it ought now to be known, that this Meeting had done nothing more valuable than to show the insufficiency of all theories and remedies hitherto advanced.*"

Alas ! then, how little has it done !

On the Leaves of Phyllanthus and Xylophylla.

"A paper was read by Dr. LANKESTER, from Mr. B. CLARKE, 'On the Foliage and Inflorescence of the genera Phyllanthus and Xylophylla.'—The leafy appendages from which the flowers in most of the species of these genera spring, have been described by authors in general, up to the present time, as branches. The author, having examined their structure and relations closely, has come to the conclusion that they are in almost all cases true leaves. Several species of the genera Phyllanthus and Xylophylla were described; and the author's views of their structure explained by drawings. In conclusion, he suggested whether the additional leaf-buds, which are sometimes seen in the axils of leaves, do not originate from the base of the petiole. Such buds occur in the genus *Rubus*, in some species of which the additional bud is developed beneath the axillary bud instead of one side of it." *Report in the Athenæum of the Proceedings of the British Association.*

Autumnal flowering of Trees and Shrubs. By EDWARD NEWMAN.

THE summer which seems at last about to leave us, has been remarkable for unusual abundance of sunshine and unusual deficiency of rain. From the middle of May to the first of August, the fine weather was uninterrupted: on that day occurred the memorable storm of hail and rain, and the weather for ten days continued unsettled, inclining to rain: from that time to the present it has been almost uniformly bright, dry and serene. Whether we are to attribute to these circumstances the facts I am about to mention, I must leave others to decide; they seem worthy of this slight record.

During the last week in August, and nearly throughout September, we have had a second inflorescence on the following trees.

Horse Chesnut. On one tree, a general and healthy bloom accompanied by a general reproduction of young leaves:—maximum, 29th August. Fruit produced.

Plane (*Acer pseudoplatanus*). On one tree, a general and healthy bloom; on several others a partial bloom:—maximum 31st August.

Corchorus or *Kerria Japonica*. A general and healthy bloom on a great number of trees:—maximum, 2nd September.

Laburnum (*Cytisus Laburnum*). A very partial but beautiful bloom, on a great number of trees:—maximum, 2nd September. Fruit subsequently produced.

Pear tree. On one tree a general and healthy bloom :—maximum, 6th September.

Pyrus Japonica. On very many trees a scattered but healthy bloom up to the present time.

Apple tree. On one tree a general and healthy bloom ; on others, a partial bloom :—maximum 10th September.

Elder, (*Sambucus niger*.) On one tree a general and most beautiful bloom :—maximum, 17th September.

Acacia. (*Robinia pseudacacia*). On two trees a general and most healthy bloom :—maximum, 11th September.

I do not know whether these two trees had previously flowered during the present year.

In a great number of instances the lime stems have produced a second and abundant covering of leaves ; but I have not observed blossoms. In London and its immediate vicinity, the leaves remain on the limes but a very few weeks ; in Wellclose Square, I have known the trees entirely stripped before the end of July. In Bishops-gate church-yard they usually remain ten days later.

EDWARD NEWMAN.

On the occurrence of Juncus diffusus near Hoddesdon, and on its specific distinctness from J. glaucus. By JOHN ANSELL, ESQ.

Nor having observed any notice of the *Juncus diffusus* of Hoppein the 'Phytologist,' since Mr. Backhouse's mention of it in the number for November, 1844, I presume that no one has recently met with it, and that it is still a plant unknown to the generality of British botanists. Perhaps too its having been made a variety of *J. glaucus* in the 'London Catalogue,' may have prevented so much attention being given to it as it deserves. As I have recently seen it growing in great plenty, and feel satisfied of its distinctness as a species, I wish to draw the attention of your readers to it, that this point may be settled, and something learned of its distribution in Britain.

On Saturday afternoon last, I paid a visit to Hoddesdon, in company with Mr. Coleman of this place. We gathered *Salvia verbenaca*, *Stellaria glauca*, *Spergula nodosa*, *Polygonum minus*, *Mentha sylvestris*, *Silene noctiflora*, &c., in the neighbourhood of Hoddesdon, and were shown *Iberis amara*, growing with *Delphinium consolida* and *Calendula officinalis*, in a corn-field there. In returning to Hertford by way of Goose-green and Mangrove-lane, about sun-set, we diverged into a barren pasture, (about three miles south of Hertford, and

adjoining Broxbourne Wood, on the North), to look at *Calamagrostis Epigejos* growing in the hedge. Here our attention was caught by a tuft of rushes, which Mr. Coleman at once pronounced to be *J. diffusus*, being acquainted with the plant by a previous discovery of it near Cole-green, three miles West of Hertford, in the year 1844. Singularly enough we were unable to find any more in the pasture than this one tuft, though it was overrun with other species of *Juncus*; but on emerging from this field on to a small scrap of roadside grass called Darman's green (already known to us as one of the numerous stations for *Carex axillaris* in this county), we were delighted to find that there was as much of *J. diffusus* as *J. glaucus*, in the large crop of rushes it produced. I observed that the two plants might be distinguished at a distance of several yards, even by the imperfect light we then had, the sun having now set, by the dark hue which the large black shining capsules gave to the panicle of *J. glaucus*, those of *J. diffusus* being of a light brown, and far smaller. In the large series of specimens which we gathered, we found no intermediate forms; but the species were always readily distinguishable by good and constant characters; *J. glaucus* having constantly a fluted stem with interrupted pith, and an elliptic capsule about equal to the segments of the perianth: while *J. diffusus* has a smooth stem with continuous pith, and an obovate truncate capsule, shorter than the perianth. In the truncate capsule it approaches nearer to *J. effusus* and *J. conglomeratus*: but in these the capsule equals the perianth and is nearly as broad as long, not elongate as in our plant, and the scales at the base of the stem are not, in *Juncus diffusus*, light-coloured and scarious (as is the case in them), but dark brown and polished as in *J. glaucus*.

I enclose specimens for your satisfaction, and, if you think them worth your acceptance, shall be happy to place in your hands a supply for distribution among your friends and correspondents.

JOHN ANSELL.

P. S. An evening or two since I met with *Amaranthus retroflexus*, *Linn.*, on waste ground near Hertford; it has also been found by Mr. Wolsey near Sawbridgeworth, and seems as much entitled as some others to a place in our floras. I find also *Setaria viridis*, and *Panicum Crus-galli* in the same place.

Hertford, Nurseries,
September 16th, 1846.

On the power of Oxalis Acetosella and Viola canina to produce fertile Seed without apparent inflorescence. By H. DEANE, ESQ.*

IT is now about five years since I had a glass case made wherein to grow a few hardy ferns, after the manner proposed by Mr. Ward, and in which I discovered the curious fact lately mentioned to you respecting the fertilization of the seed of *Oxalis Acetosella*, without the slightest appearance of inflorescence, and I will now endeavour to give you a correct history of the facts as observed, that in case you should think them worth recording in your *Phytologist* you may do so.

Having planted my ferns in small pots, they were arranged in the case, and intermediate spaces carefully and lightly filled in with some moss obtained from a neighbouring nurseryman. Moss was also placed over the mould in the pots, to keep it moist and to protect the young ferns. In the course of a few weeks many plants began to spring forth from the moss, and among them a few of *Oxalis Acetosella*. As with me the wood-sorrel has ever been a favourite plant, I allowed them to grow. The first year they did not flower, but in the following spring they did, but without that peculiar character which adds so much to the beauty of the plant in its natural state, viz., the redness of the stalks, and the delicate striated appearance of the petals. At first I doubted its identity with my old favourite, but thought seed-pods would soon decide the matter. Alas! before the pods had time to mature, the flower-stalks broke down with dropsical decay, and my hopes were gone for that season. However the plants grew vigorously, and numerous seedlings had from the early spring made their appearance, so there was no fear of the stock being lost. I watched my plants almost daily through the summer, and from the day that the last flower fell to the ground, many buds reared their heads above the foliage, and at length fell dropsical and abortive, as I thought, without an attempt at expansion. Thus the second year passed away.

In the mean time I was much puzzled and surprised at the number of seedling plants, that continued to rise in all directions.

The third year, as my ferns did not make satisfactory progress, the pots were removed, the greater part of the *Oxalis* thrown away, and the moss shaken up and mixed with a little garden mould, in which bed the ferns were planted mostly without the pots. The old rhizomes of the *Oxalis* that escaped destruction, soon made new plants, and numerous seedlings also sprang up, so that I began to

* In a letter addressed to E. NEWMAN.

think of the old proverb, that "familiarity begets contempt," even with old friends. Well, I let them grow, but there was no attempt at flowering this year, although numerous buds continued for months to arise from the strongest plant. Still seedlings kept coming up, and I began to observe many seeds of a brownish yellow colour, lying on the surface of the mould, and here and there suspended in the foliage of the ferns.

My curiosity was now much excited to ascertain the meaning of this, particularly as the seeds soon vegetated and produced young plants of the *Oxalis*. I watched carefully and repeatedly at all hours of the day, and soon had my pains rewarded by *seeing* the pods, that had been formed *without having expanded or flowered*, discharge their seeds with great force. There could now be no doubt as to the source of most of my young plants of this season. Succeeding years have shown the same series of phenomena, but as this summer they were becoming too plentiful, I took out all I could find, yet there are two or three again making their appearance, and will enable me to give you a living plant in the state I have been describing.

So long as there was no resting place for the seeds on the surface of the moss, and the fronds of my ferns were too small for them to lodge on, the real truth of the matter eluded my observation. But now there can be no doubt of the fact, that these seeds were fully matured and made capable of germinating, and did germinate through several generations, although, from the first appearance of the bud, it assumed and maintained the appearance of a pod of seed, *without the slightest outward trace of a corolla, stamens or pistils!*

I am but a sorry botanist, although fond of plants as most persons, and cannot therefore describe the anatomy of these metamorphosed flowers, yet I will give you my views in a few words, which you can verify or disprove by your superior knowledge and discrimination, with the assistance of the pickled plant you will receive with this letter.

In the early spring, flower-buds arose and expanded in the natural manner. As soon as the usual flowering period was passed, a multitude of flower-buds continued to arise, but instead of their proceeding to form petals for the corolla, the calyx, or rather the membranous edge of the calyx only, seemed to enlarge, forming a pod of a pale yellowish green colour, spotted with pale dirty pink spots. When these pods had acquired the size of a large pea, and sometimes when smaller, they appeared to be ripe, a little slit suddenly opened and discharged one or two seeds, and these discharges took place at inter-

vals until nearly all the seeds had left the capsule. By that time the *dropsy* had got the mastery of the stalk that supported the pod and down it fell. The force with which they were propelled, sent many of them a distance of two feet, and each discharge was accompanied by a smart cracking sound.

This mode of fructification I have found has not been confined to my Ward's case, for a plant that had been put into a pot and kept in the open air, where it vegetated but indifferently in consequence of smuts and dust, also fructified in the same way without a blossom. I have also at this time a plant of the dog violet (*Viola canina*) that is passing through similar changes, which you shall have for inspection, as the inferences to be drawn from the circumstance will be better from your pen than mine.

H. DEANE.

Clapham, September 18th, 1846.

P. S. I should have mentioned that the case is placed under a wall nearly due north, and surrounded with buildings, so that it rarely happens to get a ray of sunshine.

Notice of the 'Annals and Magazine of Natural History,' Nos. 117 and 118, dated August and September, 1846.

(Continued from page 588).

No. 117. Contents: "Notices of British Hypogæous Fungi," by the Rev. M. J. Berkeley and C. E. Broome, Esq. "On the regular arrangement of Crystals in certain organs of Plants," by Edwin J. Quekett. "Excursion in Upper Styria, in 1842," by Dr. R. C. Alexander. "Remarks on some points in the Structure of Cucurbitaceæ," by Dr. J. E. Stocks. "Miscellaneous." Barneoud "On the Organogeny of irregular Corollas." M. Bouchardat, "Do Plants placed in a solution containing several substances, absorb certain substances in preference to others?" M. Unger "On the Nectariferous Glands of Leaves, and on some Saccharine Secretions." "Obituary, Mr. Thomas Edmondston."

Several species of Fungi, new to science, or new to Britain, are described in the paper of Messrs. Berkeley and Broome. The regular arrangement of crystals is detected by Mr. Quekett in the testa of the seeds of *Ulmus campestris*, and in the sepals of *Geraniaceæ* and Mal-

vaceæ. On the ground of this similar peculiarity, supported by various analogies of structure and number of parts, Mr. Quekett thinks that Malvaceæ should be placed nearer to Geraniaceæ than they are usually placed by systematists; Balsaminaceæ, Tropæolaceæ, Oxalidaceæ and Linaceæ, showing no such arrangement of crystals. But the fact of the regularity is, perhaps, more important than the inference connected with technical arrangements; for we are afterwards informed by Mr. Quekett, that "the sepals of the strawberry exhibit the clustered variety as seen in the Geraniaceæ." The remarks on Cucurbitaceæ bear chiefly on views of structure as connected with technical classification, and appear matters of intellectual curiosity, more than points of practical usefulness; but they deserve the space allotted to them. Bouchardat's conclusion, in antagonism with that of Saussure, is, "that a vegetable freely immersed by its roots, in a very dilute solution of several salts, having no chemical action on its tissues, absorbs all the substances contained in that solution in equal proportions."

No. 118. Contents: "On the growth of Cell-membrane," by Hugo Von Mohl (translated from the *Botanische Zeitung*). "Proceedings of the Linnean Society."

C.

Notice of a Monstrosity in the Flowers of the common Sweet William
(*Dianthus barbatus*), found at Ross, June 27, 1846. By WM.
H. PURCHAS, Esq.

IN this curious state of the plant each branch of the fascicle, the ultimate ones excepted, produced a flower, of which the calyx was unusually large, yet having no more than the usual number of teeth, the petals unusually numerous, and the stamens wholly wanting.

In the centre of the flower was one large ovary, closed at the top, and containing, besides imperfect ovules, a second ovary, and this, again, enclosing a third and very imperfect one. Surrounding this large ovary were five more or less imperfect flowers, all destitute of calyx, and having their pedicels inserted in a fleshy ring. Of some the ovaries contained ovules, of others, a succession of carpel-like leaves. Although there were no stamens in the main flower, a few were intermixed with the petals of the smaller ones.

A somewhat similar monstrosity occurred at the same time in a

flower of the clove carnation. The calyx was not remarkable except for its size, the petals and stamens were very numerous; in the centre of the flower was one large ovary, open at the top, from which, at small intervals, sprang five styles. This ovary contained, besides, a few rudimentary ovules at the base, five or more ovaries, one within the other; one or two contained some rudiments of ovules, the innermost and very small one, a few leaf-like scales only. Mixed with the petals were five or more rudimentary ovaries on pedicels, and surrounded by petals.

W. H. PURCHAS.

Ross, Herefordshire,
September, 1846.

The occurrence of Crocus nudiflorus in Meadows near Derby.

By J. WHITTAKER, Esq.

HAVING learned from an old list of Derbyshire plants that *Crocus nudiflorus* was formerly found in the neighbourhood of Derby, I started on Saturday last in quest of it. I was fortunate enough to find it in abundance in a large meadow called the Siddalls, on the banks of the Derwent, near the Derby railway station.

Should this rare and beautiful plant be a desideratum with any of the readers of the 'Phytologist,' I shall be happy to supply them with specimens.

JOS. WHITTAKER.

Breadsall, near Derby,
September 15, 1846.

Correction of an Error. By EDWARD FORSTER, Esq.

IN your last 'Phytologist,' (Phytol. ii. 611), your printer, under *Pedicularis palustris*, has made me say that which I did not intend, "near the Sea sparingly." I wrote *Lea*, meaning the river Lea. The spot where I have seen it, is in Walthamstow marsh, opposite Upper Clapton, not far from the High bridges. There is also the trifling omission of a letter in the name of the house at Woodford, in which Warner, the author of the '*Plantæ Woodfordienses*,' dwelt: it should be Harts, not Hart.

I hope Mr. Salmon has no reason to suspect that the *Cyperus fuscus* was planted on Shalford Common; if not, this second discovery

of so rare a plant is exceedingly interesting. Having already expressed my sentiments on this *very improper* practice, I need not now repeat my protest against it.

EDWARD FORSTER.

Woodford.

Fairy Rings. By the EDITOR.

OUR observations in the September number (Phytol. ii. 620) seem to have attracted that attention to which we think the subject is fairly entitled: supposing the theory we have therein promulged to be true, then are the innumerable hypotheses of fairy-rings, without a single exception, based on error: supposing, on the other hand, our views to be hypothetical, then must deductions be no longer drawn from facts, but our knowledge must cease and determine with the facts themselves. For our own part, we have always held that theory is the legitimate child of science, and we regard the aspersions so often cast on theory, as the natural result of mental inability to distinguish between theory and hypothesis. Now hypothesis being founded on figment, can have no claim to a place in any walk of science, for the very essence of science is fact, truth, reality. Our view of the origin of fairy-rings, then, comes clearly under the denomination of theory, being deduced from obvious fact.

There was, however, one point left untouched, and that a most interesting, if not important one: we allude to the altered colour of the grass, indeed, to that very circumstance which has called attention to the subject; for were not these rings marked by the altered colour, we doubt the circular distribution of the agarics ever leading to an inquiry into the cause: we could readily have suggested that the decomposition of the agarics fertilised the soil, but we found ourselves without proof of their fertilising properties. This proof is now supplied.

A Mr. Way has subjected some of the agarics to a chemical examination, and has found that they contained 87·46 per cent. of water and 12·54 per cent. of dry matter. He has given the following analysis of the dry matter:—

Analysis of the Ash of the Agaric of the Fairy-rings.

Silica	-	-	-	-	1·09
Lime	-	-	-	-	1·35
Magnesia	-	-	-	-	2·20
Peroxide of iron	-	-	-	-	a trace.
Sulphuric acid	-	-	-	-	1·93
Carbonic acid	-	-	-	-	3·80
Phosphoric acid	-	-	-	-	29·49
Potash	-	-	-	-	55·10
Soda	-	-	-	-	3·32
Chloride of sodium	-	-	-	-	0·41
					<hr/>
					98·69

Those who are acquainted with the recently published theory of manures, will at once see from this analysis that the agaric is almost entirely composed of the most valuable manures: 29 per cent. phosphoric acid, 55 per cent. potash: the inevitable result of these manures being so abundantly deposited on the surface of the ground, is an increased growth in the herbage and a consequent change of colour. Our personal observations did not extend to grass preserved for mowing, but Mr. Way declares that the grass of which these rings are formed, is "*always the first to vegetate in the spring, and keeps the lead of the ordinary grass in the pastures until the period of cutting.*" This may be regarded as positive proof that the circle has received some extraordinary supply of manure, and the analysis now explains to us whence that supply comes.

Satisfactory as this appears, and indeed, *is*, our readers must bear in mind that it only touches that branch of the inquiry which relates to the influence of the fungus on certain phænogamous plants, the origin, increase, and mode of growth of the fungus itself remains untouched: indeed, from the report of Mr. Way's paper in the *Athenæum*,* it is evident that he has no conception of what we suppose to be the true state of the case.

He is made to say "A fungus is developed on a single spot of ground, sheds its seed and dies." This, as far as we can comprehend the meaning, is purely hypothetical: but we are at a loss to ascertain Mr. Way's precise meaning; does the expression "*is developed*" im-

* We have to regret the extreme incorrectness and almost unintelligibility of this report: even the author's name and the analysis are, as Mr. Way points out in a subsequent number, ridiculously erroneous.

ply that the agaric is the entire produce of a seed of another agaric, as an oak tree is the entire produce of an acorn or seed of another oak tree? If so, it is quite at variance with our own observations: we believe that the seed of an agaric does not produce another agaric except as an ultimate result, and then not one but many. We have no proof of the existence of isolated agarics *on a single spot of ground* any more than of isolated acorns. We have never found an isolated agaric. Again, a crop of grass springing from rotting agarics is compared to a phoenix,* a simile we cannot understand. The old fable was, that the ashes of one phoenix produced another phoenix, not that a phoenix sprung from some foreign substance going to decay.

But we feel that we are not doing the author justice in thus criticising observations which the reporter may have been unable to comprehend, and we beg to assure him that we shall be happy to publish his paper entire in the pages of the 'Phytologist,' so that all our botanists may have an opportunity of reading and judging for themselves. There is, however, one passage which we think it desirable to quote, as tending to throw great weight into the scale in favour of our theory. He says the agarics are "*situated either entirely on the outside of the ring or on the outer border of the grass which composes it.*" Now we must confess that in those numerous rings which we have examined in Sussex, Surrey and Herefordshire, this remarkable fact had escaped us, but seeing it thus laid down as a simple fact, and not brought to bear on either theory or hypothesis, we cannot but accept it, and our readers will in a moment see how directly it tends to establish our view as to the radiation of the mycelium or *real fungus* from a common centre, and its development of blossoms or agarics at the extremities.

Remarks on the Banana in Navigator's Islands, on Achillea serrata, on Alyssum calycinum, and on Juncus diffusus. By W. L. NOTCUTT, Esq.

Banana. In the 'Phytologist' for March, 1843 (Phytol. i. 527, 528), there is an extract from a letter addressed by Mr. N. B. Ward to Prof. Graham, respecting the introduction of the banana into the Navigator's Islands by the late Rev. J. Williams. Having, within the last day or two, been favoured with the company of an esteemed

* "A vigorous crop of grass arising, like a Phoenix, from the ashes of its predecessor."

missionary from those islands, I mentioned the statement above alluded to, and was surprised to find that there are several inaccuracies in it. The latter part of the statement would induce a supposition in the mind of any one not acquainted with the Flora of those islands, that the banana was first introduced there by Mr. Williams, but my informant states that the banana is indigenous there, and that it was only another species which Mr. Williams introduced; the fruit of which, as experience has proved, is not liked by the natives nearly so much as that of the native species. There were about twelve different kinds of banana growing freely in the islands previously to the introduction of the *Musa Cavendishii* by Mr. Williams; but whether these are all, or only some of them, distinct species, I am unable to say, as my informant (the Rev. J. B. Stair), not being a botanist, can give only the native names of them. Although, however, Mr. Williams's benevolent intentions in taking out the *Musa* do not appear to have effected the end he had in view, I may, perhaps, be allowed to state, that a very substantial benefit would be conferred upon those islands if, when the "John Williams" (which is now, I believe, on her way home) next sails from England thither, some benevolent botanist or society would supply her with a Ward's case or two, filled with healthy, living specimens of some of the more important medicinal plants, such as *Cephælis Ipecacuanha*, some of the most useful species of *Cinchona*, *Cocculus palmatus*, any of the *Senna*-bearing *Cassias*, *Punica Granatum*, *Ipomœa Jalapa*, *Rheum palmatum*, *Smilax officinalis*, &c. The *Colocynth*, and some species of *Aloe* and *Ricinus* seem to have been introduced there already. The natives suffer greatly from intermittent fevers, scrophulous diseases, elephantiasis, inflammatory affections, &c. Some native teachers were sent to an island where the inhabitants were still in a state of barbarism and paganism; and ere the "John Williams" visited them again, five of their number had been cut off by intermittent fever, and their scanty supply of medicine exhausted. There being at present no professional aid on the islands, the natives are compelled to resort to their missionaries for such medical aid as they are able to afford, while, from the great distance of any place whence medicines can be procured (Sydney, the nearest, being 4000 miles from a considerable part of the islands), and from the infrequency of communication, the supply of medicine is very uncertain. The prices charged at Sydney are very high, being 100, 150, 200 per cent., or even more, above English prices, so that they have not the means of procuring a sufficient supply. It would therefore be a most important benefit to the

inhabitants of that distant part of the world, and to the missionaries themselves, if such medicinal plants as are most likely to succeed under a tropical sun, and to be of most service in the diseases there common, could be introduced among them. With them it would be advisable to send a statement of their properties, and some directions as to soil and culture. They would then have remedies within their reach, and the missionaries might be furnished with more accessible means of relieving the bodily as well as the spiritual necessities of those for whom they labour. I trust I shall be pardoned in making these remarks; for surely one great end of botanical science is its practical application, and if two or three cases of medicinal plants may be the means of relieving the sufferings of a distant, recently civilized, and interesting people, it will be an important and valuable service rendered by science to the welfare of mankind at very small cost.

I may state that Mr. Stair has brought home with him a collection of lithographic impressions of the leaves, &c., of a considerable number of the plants indigenous to the islands, fronds of the native ferns, sections of stems, &c., which he intends depositing in the Missionary Museum, Blomfield St., Finsbury, where any botanist can inspect them free of charge. There may probably be some interesting plants among them.

Achillea serrata. Now to pass to a different subject more connected with British Botany. There appears to be some confusion or error in the published description of *Achillea serrata*, to which I wish to draw attention. Two specimens which I possess, through the kindness of J. Hardy, Esq., of Sheffield, have their leaves *pinnatifid*, with the divisions serrate, and the corymb compound. In the 'Hortus Kewensis' the character is as follows:—

"*Achillea serrata*, foliis tomentosis lineari-lanceolatis *pinnatifidis*: laciniis basi profundioribus."

In Babington's Manual these points in the character are thus noticed: "Leaves.....linear-lanceolate, bluntish, downy.....coarsely and doubly serrate, with spreading serratures, lacinated and radiating at the base.....corymb nearly simple." From this I think any one would infer that the leaves are not *pinnatifid*. In my specimens they are truly *pinnatifid* for at least $\frac{3}{4}$ to $\frac{1}{2}$ of their length, the pinniform lobes of the leaf being $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long and about $\frac{1}{10}$ inch in breadth. The length of the leaves is from three to four inches in my specimens. The corymb is repeatedly branched, quite as much as, or more so than in *A. Millefolium*. The locality of my speci-

mens is thus described: "Cromford Moor, near Matlock, Derbyshire, July 24, 1843. — J. Hardy."

Alyssum calycinum. I am also happy to be able to add another to the known localities for *Alyssum calycinum*. It was found (for the first time in this county) last summer, by Miss Carr, of Foulsham, in a field at Twyford, near that place, in some plenty. I possess specimens from the locality.

Juncus diffusus. During the present summer I have visited Hunstanton, the locality where Mr. James Backhouse, Jun., states that he found a *Juncus*, which he supposed might turn out *J. diffusus*. I found the plants in the spot he describes (Phytol. i. 1140), but could find only a few, which differed from *J. glaucus* in possessing solid instead of cellular pith, and on submitting some of these to Mr. Babington, he pronounced them *J. glaucus*, and stated that Mr. Backhouse's plant proves to be the same. It may be worthy of notice that the solid pith will not alone serve to distinguish the two plants, as some of the specimens of *J. glaucus* had perfectly solid pith. *J. diffusus* has been found in Hertfordshire by Mr. Coleman.

WM. L. NOTCUTT.

Fakenham, October 2, 1846.

On the Specific difference of Glyceria plicata and G. fluitans.

By THOMAS MOORE, Esq.

I PERCEIVE that at p. 484 of the 'Phytologist,' where mention is made of *Glyceria plicata*, there is some implied doubt as to its distinctness from *G. fluitans*. It may therefore be interesting to state that continued observation of the two plants, both in a wild and cultivated state, serves only to confirm my original opinion of their distinctness. As far as I have observed, *G. plicata* may *always* be distinguished from *G. fluitans* in a growing state, by its broad, bluntish, *glaucous* leaves, which are so obviously different from those of the other plant, as to make it somewhat singular that they could, by any possibility, have been confounded with each other. The shorter and differently formed outer paleæ in *G. plicata*, are also constant characters, by which all the plants I have observed might readily be distinguished. The purple anthers in the one, and the yellow (or pale buff) anthers in the other, are also constant characters, as well as their difference in size and form.

It may be useful to quote Mr. Babington's characters for these two

plants, as given in the 'Annals and Magazine of Natural History,' vol. xvi. p. 232 (1845).

"*G. plicata* (Fries). Panicle compound; branches compound, nearly smooth, divaricated whilst in flower; spikelets linear, of 7—20 flowers; outer palea oval, twice as long as broad; apex obtuse-angled, with three nearly equal teeth; *anthers thrice as long as broad (yellow)*; sheaths compressed. Resembling *G. fluitans*. Ligule shorter; dry anthers fuscous; leaves glaucous, bluntish. *G. plicata*, *Fries, Nov. Fl. Suec. Mant.* ii. 6. *F. fluitans*, *Eng. Bot. pl.* 1520. *Poa fluitans*, *Parn. Brit. Grasses*, *pl.* 145 (not good). The British plant has been compared with authentic specimens from Fries, of *G. plicata*.

"*G. fluitans* (R. Br.). Panicle subsecund, slightly branched, very long; branches nearly simple, roughish, divaricated whilst in flower; spikelets linear, of 7—12 flowers, outer palea nearly thrice as long as broad, blunt; *anthers about five times as long as broad (purple)*; sheaths compressed. Leaves pale green, acute. Ligule elongate. Outer palea blunt, with a triangular central point. Dry anthers pale yellow. *Poa fluitans*, var. *subspicata*, *Parn. Brit. Grasses*, *pl.* 95. This plant is considered as the true *Festuca fluitans* of Linnæus, by the Swedish botanist; it was originally published under that name in *Linn. Fl. Suec.*"

On comparing the two plants it will be seen that *G. plicata* has broader (or flatter) and blunter leaves, shorter paleæ, and shorter (pale coloured) anthers. *G. fluitans*, has narrower (or half-folded) and more pointed leaves, longer paleæ, and longer (purple) anthers.

T. MOORE.

List of British Rubi found in the neighbourhood of Twycross, Leicestershire. By the Rev. ANDREW BLOXAM, M.A.

R. idæus, <i>Linn.</i>	R. Babingtonii, <i>β. Bloxami</i> , Bell Salt.
— plicatus, <i>W. & N.</i>	— rudis, <i>W. & N.</i>
— nitidus, <i>W. & N.</i>	— radula, <i>W. & N.</i>
— corylifolius, <i>Sm.</i>	— <i>β. hystrix</i> , Bell Salter
— var. do.	— lingua, <i>W. & N. ?</i>
— rhamnifolius, <i>W. & N.</i>	— fusco-ater, <i>W. & N.</i>
— fruticosus, <i>W. & N.</i>	— Kœhleri, <i>W. & N.</i>

- | | |
|--------------------------------------|-----------------------------------|
| R. macroacanthus, <i>W. & N.</i> | R. pallidus, <i>W. & N.</i> |
| — discolor, <i>W. & N.</i> | — rosaceus, <i>W. & N.</i> |
| — leucostachys, <i>Sm.</i> | — Lejeunii, <i>W. & N.</i> |
| — vestitus, <i>W. & N.</i> | — Schleicheri? <i>W. & N.</i> |
| — sylvaticus, <i>W. & N.</i> | — dumetorum, <i>W. & N.</i> |
| — carpinifolius, <i>W. & N.</i> | — cæsius, <i>W. & N.</i> |
| — amplificatus, <i>Lees.</i> | |
- A. BLOXAM.
- Sept.*, 1846.

Notice of some localities of Plants in Cornwall &c., in the 8th month,
1846. By GEORGE STACEY GIBSON, Esq.

SEVERAL partial notices of the Botany of Cornwall have already appeared in the pages of the 'Phytologist,' of which the following notes may be considered a repetition, yet as they contain some fresh matter, and take up rather a wider range of country, I trust they will not be wholly uninteresting to its readers, though for the sake of brevity I shall confine my observations very much to actual facts, and not descant on the beauties of the country or other incidental subjects, which might render it more suitable for the general reader. Cornwall is a most interesting county, both as relates to its scenery and its productions, animal, vegetable, and mineral, many of which are different to those met with in other parts of this island. The climate being so mild is doubtless one great cause of the presence of plants unknown in colder regions, and the great extent of sea coast affords a variety of marine animals and plants, equalled by few districts of the same extent. My chief observations were made in the neighbourhood of Penzance, where therefore I shall first direct attention. This is the most westerly town of England, pleasantly situated on Mount's Bay, and presents many attractions for the tourist as well as for the naturalist, the neighbourhood furnishing a greater variety of walks than almost any other of similar situation. In the Guide Book to this place there is an excellent notice of the Botany of the district, and I was much indebted to two gentlemen resident there, for directing me to the localities, one of whom kindly accompanied me in several rambles. To prevent confusion it may be well to divide the plants of this district into Sea, Bog, and other plants, including those in hedges, on walls &c. Of the first class there is not so great a variety as in some other districts, on account of the small amount of salt marshes, that near Hayle being the only one of any extent; on it are found Sali-

cornia herbacea, *Glaux maritima*, *Lepturus incurvatus*, &c. On the sandy shore towards Marazion, *Eryngium maritimum*, *Salsola Kali*, *Alsine peploides*, *Atriplex rosea*, *Beta maritima*, *Cakile maritima*, *Carduus tenuiflorus*, *Convolvulus Soldanella*, *Glaucium luteum* sparingly, *Polygonum Raii*, *Pyrethrum maritimum* &c. are met with. On the sea cliffs, at the Logan-stone, St. Ives, &c., *Daucus maritimus* and *Crithmum maritimum* grow abundantly; I can scarcely believe that the former of these plants is more than a maritime variety of *Daucus Carota*, which is a most abundant plant in Cornwall, and appears to assume a more fleshy character as it approaches the sea, as is the case with many other plants; the points of distinction are very slight, and such as are likely to be caused by the effect of salt air, viz., the thick leaves and short comb-like prickles on the capsules. *Aster Tripodium*, *Plantago maritima*, *Silene maritima*, &c., are generally found on the cliffs, and those at Newlyn produce *Centranthus ruber*. On the western green we find *Foeniculum vulgare*, while on the eastern side is *Erodium maritimum*, which is however more plentiful on St. Michael's Mount; *Lavatera arborea* grows on the cliffs at Mousehole. Near this little fishing village is a large cave, formed in the cliff by the action of the water, the lofty roof and sides of which are beautifully festooned with luxuriant ferns of very large size; *Asplenium marinum* is here most abundant, and it is not uncommon along the coast. I saw it at the Logan, St. Michael's Mount, &c. *Senebiera didyma* grows on the road-side near the wherry, and on the sands near the same spot, *Trifolium subterraneum* is met with sparingly. The very rare *Cynodon Dactylon* grows plentifully in many parts of the green towards Marazion, particularly opposite Gulval Church; when not in flower it may readily be distinguished by its glaucous foliage and creeping stems. Though the few last may not exactly belong to the head of sea plants, yet as their localities are similar to those given for others of that class, it seemed to be the most natural place to refer them to. *Diotis maritima*, which grew here in Ray's time, has long since disappeared, and *Euphorbia Peplis* has not been gathered for several years as I am informed, and must therefore be considered lost in this locality; I carefully searched the sands and the green from Marazion to Penzance, but could find no trace of it. In the bog-plants, Penzance is rich, as many of the upland moors and boggy valleys present us with some very interesting species. Chyangall is one of the most productive of these moors, though limited in extent; here I gathered *Cicendia filiformis*, *Littorella lacustris*, *Illecebrum verticillatum* abundantly, *Anagallis tenella*, *Peplis Portula*, *Isolepis fluitans*,

Hypericum elodes, *Nymphaea alba*, *Narthecium ossifragum*, *Radiola Millegrana*, *Scutellaria minor*, *Wahlenbergia hederacea*, *Osmunda regalis*, &c. In a marsh near Gulval are found *Carex paniculata*, *Cladium Mariscus*, *Drosera longifolia* and *rotundifolia*, *Lycopus europæus*, *Menyanthes trifoliata*, *Sparganium simplex*, &c. And beyond Gulval, in a hollow between the hills, is a bog, which contains *Schœnus nigricans*, *Rhynchospora alba*, *Pinguicula lusitanica*, and occasionally *Bartsia viscosa*, which we saw in a field adjacent; this latter plant I also met with by the road side, between Tol Pedn Penwith and the Land's End, also towards Marazion, but always in small quantities. It is said to be frequent about St. Austle, as well as *Cicendia filiformis* &c. *Alisma ranunculoides* grows near Marazion, also *Isolepis Savii*, which I noticed at St. Ives, &c. *Osmunda regalis* is very fine and abundant in many of the marshy hedges and thickets, and some of the plants above enumerated will be found on most of the bogs in the neighbourhood. *Briza minor* is generally found near marshy ground, though not on it, but in fields or road sides; I gathered it sparingly near Chyangall, and more plentifully beyond Gulval: the first crop had disappeared, and these were late sown plants. In the ponds at Treng Wainton, *Chara translucens* is abundant; *Typha latifolia*, &c., are also found here. The plants not included in the two foregoing heads, may now be briefly mentioned. *Anthemis nobilis* is most abundant on nearly all the open downs, scenting the air as you ride or walk over it: *Antirrhinum Orontium* is occasionally met with; *Aquilegia vulgaris* near Hayle, *Calamintha officinalis*, *Chenopodium murale*, *Fumaria capreolata*, *Helminthia echioides*, *Hieracium umbellatum*, *Lepidium Smithii*, *Linaria Elatine*, *Linum angustifolium*, *Rumex pulcher* and *sanguineus*, *Cœnanthe crocata*, *Ornithopus perpusillus*, &c., are common in the neighbourhood. *Clematis Vitalba* grows near Alverton Bridge; *Erodium moschatum* is abundant on several dry banks near the town, especially in the path leading to the baths; *Mentha rotundifolia* grows on the western green, and is not uncommon in moist situations. *Rubia peregrina* is rather rare; *Stachys ambigua* is plentiful in Love Lane and some other places. The rare *Scrophularia Scorodonia* I noticed in several places by the road side, as beyond Newlyn, at Chyandower on the road to St. Ives, by the cross on the Land's End road about two miles from Penzance, and also near St. Ives in ascending the hill on the old road. The cross above mentioned is a locality given in Watson's Botanist's Guide for *Lotus angustissimus*; that plant and *L. hispidus* were then confounded together, and it is the latter which was here intended, as it still grows

sparingly in that spot, on the opposite side of the road. *L. angustissimus* I was not fortunate enough to discover, though several localities are given for it in West Penwith. *Sibthorpia europæa* is not rare on wet shady banks, as on the road to Rose Hill, and in a lane beyond Gulval rocks. *Geranium striatum* is apparently wild on the road to Castle Horneck, growing abundantly among the grass, with its beautifully pencilled flowers sprinkled amongst it; it must certainly be established as a naturalized plant, as I heard of its being found in more wild situations near St. Austle, &c., and at least deserves a place in the British Flora as much as many recently added species. On the dry grounds near the Logan-rock I gathered *Mœnchia erecta* and *Spergula subulata*. *Cotyledon Umbilicus* is very common on walls and rocks; *Iris foetidissima* is rare, but I saw it between Hayle and St. Ives; *Cuscuta Epithymum* grows on furze near Tol Pedn Penwith and other places. The ferns flourish most luxuriantly, and are very beautiful in this neighbourhood, though there may not be so great a variety as is sometimes met with; there are however several rare species: *Asplenium lanceolatum* is not uncommon on walls, as near Chyandower at the Land's End, and on rocks at St. Michael's Mount, where it is also accompanied by *Lastræa recurva*; the latter also grows in some other places: *Osmunda regalis* is common, as has been already stated. The very elegant *Adiantum Capillus-Veneris* is found in a cave about two miles along the coast between St. Ives and Hayle, the finest specimens are out of reach, and appeared very luxuriant, the fronds and stalks of some of those I gathered being more than a foot in length. In the lower parts, where it has been more frequently gathered, the plants dwindle, but it is abundant though very limited in extent. I believe it is also found in one or two similar spots nearer Hayle. It was an interesting sight, though rather too early in the season, as the time for flowering was scarcely arrived.

Having now completed a hasty notice of the plants which I gathered near Penzance, it may not be out of place to refer to a few which I did not see, but which are stated in several works to be found there. *Erica ciliaris* is said, in the Penzance Guide, to have been found at Lamorna, *Cynosurus echinatus* at Ludgvan, *Polycarpon tetraphyllum* at Newlyn, *Scilla verna* is frequent on the cliffs. *Lythrum hyssopifolium* is also said to grow at Ludgvan, and *Teucrium Chamædrys*; *Agrostis setacea* at Newlyn; *Reseda fruticulosa* near Marazion; *Oxalis stricta* in orchards, as well as some other introduced plants. I searched very carefully for *Iris tuberosa* without success, probably on account of the late season of the year; the locality given for this

plant in Watson's Guide is Trucliffe Lane, on the the top of a hedge turning up from Love Lane, about 50 yards from the turn. After considerable inquiry, being unable to hear of such a name as Trucliffe, I concluded it was a misprint, and that the name should be Trereife, (pronounced Treeve) Lane, where Love Lane terminates. Here then I sought several times on both sides of the hedge, but was surprised to find that an orchard extends for some distance along the road, in the midst of which, according to the description, this plant would grow: and therefore I could not but wonder that the plant had been introduced into our Flora, from such a more than suspicious locality, and where perhaps it ought scarcely to be considered naturalized; it is said to be common in several of the orchards in that vicinity.

It is a curious fact that several plants common in most other districts are unknown, or very rare, in this, as for instance the delightful *Viola odorata*, which is never found wild. Before leaving Penzance I may just say that it is even richer in cryptogamic than in phænogamic plants, and would amply repay further research than it has yet received.

The next place to be noticed I shall pass over with a very few remarks, as it has been so recently referred to in the interesting description given by W. S. Hore in his paper on the Lizard. The season was very favourable for *Erica vagans*, whose delicate white and pink flowers, waving on the crimson wiry stalks, present a most elegant and beautiful appearance. It is curious to observe how very much it is in that part confined to the Lizard, and the serpentine formation, as it appears scarcely at all till you get within about six or eight miles of the Point, when it becomes most abundant, even more so than the common species, all of which are also found there. It does however grow on Connor Downs, a few miles from Hayle. *Herniaria glabra* is plentiful near the Lizard lighthouse, and at Kynance Cove, also *Scilla autumnalis*, *Spiranthes autumnalis*, and a *Bromus*, said to be the pseudo-velutinus of the London Botanical Society's Catalogue. Kynance Cove is a delightful spot, the scenery, the formation of the rocks, and the variety of plants are most interesting. It was too late for many of its rarities, but *Anthyllis vulneraria*, *β. Dillenii*, with its rich crimson flowers, still formed a conspicuous object; *Genista tinctoria*, *β. prostrata*, *Erythræa ramosissima*, *Geranium sanguineum*, (query, was sylvaticum a slip of the pen in W. S. Hore's account of that spot?), *Hypochæris maculata* in leaf only, *Juncus maritimus*, *Orobanche rubra* the dried stems, *Spiræa Filipendula* &c. were seen. The scramble to the bellows on Asparagus Island is amply repaid

by the sight of that curious phenomenon, and the *Asparagus* which grows among the grass on the top, is a further reward to the botanist. It is not abundant there, and the guides gather it so frequently, to present to their visitors, whether scientific or otherwise, that there is some danger of its becoming eradicated in a few years.

Allium Schœnoprasum grows about half a mile north of the Cove among the rocks; the time of flowering was of course past, but I obtained a few plants of it. *Alsine verna* grows plentifully, but its appearance is such that I did not at first recognise an old Teesdale acquaintance; indeed it looks at a distance more like *Spergula nodosa*; it is rather surprising that it was not made even a variety by Smith or Hooker, and although Babington raises it to the rank under the name of *β. Gerardi*, I cannot but think it may eventually be considered a distinct species, though it may be difficult, as he remarks, to describe the points of distinction. It is so dissimilar to the usual form of *A. verna*, both in its fresh and dried state, that to an unpractised eye, they would certainly be thought different plants. Unfortunately I did not examine it minutely while growing, and the flowers cannot be well seen when dried; its peculiar dwarf habit and thick-set leaves pressed close to the stem, are striking characteristics. I hope it will claim further attention from botanists visiting that part. Along the banks of that curious sheet of water called Looe Pool, I found the three plants mentioned by W. S. Hore, viz., *Corrigiola littoralis*, *Chenopodium botryodes*, and *Elatine hexandra*, most plentifully on the south side. I also noticed *Euphorbia portlandica*, *Trifolium scabrum*, and *Spergula subulata*, near the shore, also one or two plants of *Erica vagans* in the woods above the Pool.

Returning eastward I have nothing particular to record till we reach Bodmin, where I visited the locality for *Physospermum cornubiense*, which is known there as a rare plant under its old name *Ligusticum*. I was gratified by seeing it abundantly in the outskirts of Steppe's Wood, about one and a half mile from Bodmin, turning off to the right at the first milestone on the Launceston road; it flowered chiefly among the furze &c., just outside the wood. I was informed that it also grew in several of the neighbouring woods, Margets, &c.

At Budi, on the north-west coast, *Euphorbia Paralias* and *Ammophila arundinacea* abound—here I also gathered *Statice spathulata* on the cliffs, and several other marine plants, as well as *Papaver hybridum*. The romantic little Clovelly, built as it is on the side of a precipitous hill, and surrounded by rocks and hills wooded to their base, might not be unlikely to produce some rarities, but all I noticed

there was *Saxifraga umbrosa* growing in several wet spots among the trees in great profusion ; whether or not it might have been originally planted I cannot tell, but there were no other cultivated plants around, neither did it bear any marks of having been placed there by the hand of man. At Biddeford I succeeded in finding the wall which produces *Senecio squalidus* ; it is near the Inn above the Church ; the plant is not very abundant, but I saw it also in a garden, where the woman told me it was a weed, and had grown many years. This is the best place from which to visit Braunton Burrows, but I had no opportunity for doing so. They are a conspicuous object on the road to Barnstaple, along which I saw *Artemisia maritima* and several other sea plants. While at Ilfracombe I went to see the locality there for *Adiantum Capillus-Veneris*, which is difficult of access except at low water, and at all times care is required not to be overtaken by the tide ; it is to the west of the town, beyond the first ridge of rocks after the descent to the beach by the Torre walk ; it grows there in rather a small quantity, and the lower plants are much stunted from being so frequently gathered, as I believe is the case, indeed none of it was equal in size to that near St. Ives. *Erodium maritimum*, *Chlora perfoliata*, &c., are common there. At Linton the *Hieracia* become more abundant, some of the ferns also are fine there ; *Euphorbia hiberna* grows in the wood near the "Waters meet" ; *Erodium maritimum* and *Sedum anglicum* too are frequent. *Meconopsis cambrica* near the West Lyn. . At Exeter I gathered *Bromus madritensis*, on a wall in a street opposite the Clarence Hotel, which probably is the one referred to in the Botanist's Guides.

And now I will conclude this detail of localities, many of which may be considered only as verifications of what was before known ; but even this may not be useless, in a day when cultivation and the ravages of collectors so often injure or destroy old-established localities. Sufficient, I doubt not, has been said to prove Cornwall a very interesting county in a botanical point of view, and one that would richly repay a careful investigation, especially in the Lizard and western districts.

GEORGE STACEY GIBSON.

Saffron Walden.

BOTANICAL SOCIETY OF LONDON.

Oct. 2, 1846.—Edward Doubleday, Esq., Vice President, F.L.S., in the Chair. The Secretary announced that British Plants had been received from Dr. Dickie, Mr. R. J. Mann, Mr. Samuel Hailstone, Mr. G. H. K. Thwaites, Mr. H. O. Stephens, Mr. J. Roby, and Mr. G. Lawson. The Royal Botanic Society presented two dried examples of the Orobanche sent to that Society as probably the *Orobanche lucorum* (*Braun*), but which cannot be certainly identified with the description of that species in the Synopsis of Koch. Indeed it appeared to some of the members, that the two specimens were those of different species; one being very similar to *Orobanche major*, and the other equally similar to *Orobanche elatior*. It seems highly probable, therefore, that some confusion of species has occurred, which may have increased the difficulty of determining the plants satisfactorily, and may have been instrumental in giving rise to the different views expressed by those botanists who had previously examined the plants in their living state.

Dr. Scott communicated a paper "On the Potato disease."—*G. E. D.*

Occurrence of Erica ciliaris in the County Galway, West of Ireland. By the EDITOR.

WE learn that Mr. Bergin has had the good fortune to add this beautiful species to the already extensive list of Irish heaths. Its locality is in the county Galway, and not far from Clifton, indeed, almost exactly the same as that previously recorded for *Erica Mackaiana*; a circumstance which seems to throw an additional doubt over the distinctness of that species, by suggesting the possibility of its being a hybrid between *E. ciliaris* and *E. Tetralix*.

As to the accuracy of name in Mr. Bergin's heath we have no doubt, since our esteemed correspondent, Mr. Moore, a botanist not likely to be deceived, has received specimens, and unhesitatingly pronounces them to be *Erica ciliaris*.

We have long been expecting a communication on this subject, but do not like longer to delay announcing so important a discovery.

A new locality in Scotland for Ruscus aculeatus. By the REV. GEORGE LAWSON.

ALLOW me to record a new Scottish station for the curious *Ruscus*

aculeatus, which I found some days ago in a somewhat shady place near Picallo Castle, in Fifeshire. The vicinage of this station to the old castle renders it probable that the plant may have been introduced: but as I am credibly informed the castle has not been inhabited for the last hundred years; and as the plant bears signs of vigour and health, and grows in tolerable abundance; I presume it may be set down as fairly naturalized. However, it may be indigenous, although I can see no reason for thinking so.

GEORGE LAWSON.

Dron, by Cupar, Fifeshire,
October, 1846.

Notice of 'Flore Descriptive et Analytique des Environs de Paris, par E. Cosson et E. Germain.' Paris 1845; 'Synopsis Analytique de la Flore des Environs de Paris, par E. Cosson and E. Germain.' Paris, 1845; and 'Synopsis de la Flore de Lorraine et d'Alsace, par S. Choulette.' Strasbourg. 1845.

OUR attention has been called to these little works by seeing them on Mr. Pamplin's counter, and we have been much pleased in skimming over their contents. The Paris 'Flora' is a very useful work, and, as by far the greater number of species are also British, it is peculiarly interesting to those who make the productions of our own country their particular study; the descriptions are for the most part clear and concise, two great recommendations. The method followed is that of Jussieu, the arrangement of the natural orders that of De Candolle, nearly all the recently established genera and orders being added.

Mr. Choulette's work is merely introductory, being an analytical table of the genera and species arranged under the Linnean classes: there is something clever, if not perfectly satisfactory, in the dichotomous mode of characterising the species: of this we subjoin an example.

MALAXIS.

Stem triangular with two leaves at its base... ..*Læselii.*

Stem pentagonal with 3—4 leaves at its base.....*paludosa.*

LISTERA.

Lip bifid; leaves oval.....*ovata.*

Lip trifid; leaves cordate*cordata.*

SPIRANTHES.

Stem leafy.....*æstivalis.*

Stem naked*autumnalis.*

K.

*Remarks on the Hieracium maculatum of Smith.** By JAMES
BLADON, Esq.

HAVING bestowed considerable attention on several species of Hieracium the last three seasons, but more especially maculatum, I now beg leave to lay before the Society, the result of my observations.

I have used the name "maculatum" from the circumstance that the first plants I observed corresponded exactly with Smith's description of his plant in 'English Flora,' vol. iii. p. 360, and since then, the varieties I have observed have been more easily referrible to this description of maculatum than to any of the others that are now considered cognate varieties.

The leaf. The leaves are subject to very great variations, from broadly ovate to nearly linear, the margins vary from entire or with one or two teeth about one sixteenth of an inch in length, to twelve or fourteen teeth, some of them half an inch in length and one quarter in breadth: one character I have observed to be constant through all the variations in form, at the base of the leaf (both radical and stem leaves), the membrane tapers to the midrib gradually, and is continued a short distance on the petiole, never ending abruptly as in a common ovate leaf. The purple blotches on the leaves from which Sir J. Smith took the name, I believe to depend chiefly on the season; in a hot dry summer I have found hardly any plant whose leaves were not stained, the latter part of the present summer being rather moist, it is equally rare to find one with stains: in the early part of this season the marked plants were in much greater proportion than they are now. The foregoing observations respecting the markings of the plants refer to those on the same walls, and are therefore most probably from the identical roots that plants sprung from in previous seasons. The radical leaves of maculatum I have observed to decay much sooner than any other species of Hieracium, being oftentimes withered completely by the time the second flowers are blooming.

The flowers. In the 'English Flora' great stress is laid upon the number of flowers in discriminating the various species: the number of them is the most variable character of the plant: I have had plants with only two or three flowers, and others on which I have counted near fifty flowers and buds of all sizes at the same time. Besides the difference in the number in separate plants, the same plant exhibits different numbers according to the time at which it was examined (as remarked in a note forwarded to the 'Phytologist'). The only con-

* Read before the Botanical Society of London, 6th November, 1846.

stant character belonging to the flowers is the one used by Sir J. Smith for *H. pulmonarium*, (Eng. Flora iii. p. 36); "The first partial stalk remaining always much lower than the rest," in fact the first flower is always overtopped by the next unopened buds, in the axillary branches as well as on the main stem. I hardly know any composite flower that is so much affected by a shower as *H. maculatum*, especially when growing on walls: the flower becomes rumpled and disfigured extremely, so as hardly to be in a fit state to be gathered for preservation: (I have several times lately been obliged to acknowledge the correctness of the foregoing remark). If trees are near them so that the droppings of the leaves fall on them, they are similarly affected.

The habitat. The situation that *H. maculatum* seems most to flourish in, is on old exposed walls, next stony banks on road sides, or the elevated edges of foot paths: it is rarely to be found in open fields or woods, very rarely in hedge-banks. One of the places where it grows in greatest luxuriance is on some yard-walls, from five to twelve feet in height, in one of the streets of the town.

The growth. The time when it is in highest perfection is about the latter end of July; it may then be found chiefly from two to three feet in height; as those stems decay after flowering, a second growth springs up from the same roots, or from the axil of the lowest leaf of an injured stem, and are now, September 2nd, in flower, from nine to fifteen inches high, with from three to a dozen flowers and buds.

It is very probable that some of the discrepancies of the descriptions may have arisen from their authors having seen only the latter plants of the second growth.

JAMES BLADON.

Pont-y-pool, September, 1846.

On the Flowering of Ranunculus bulbosus. By Mr. THOMAS MEEHAM.

THE time of flowering of many British plants depends so much on the nature of the season, as to make the times given in British Floras often appear erroneous. Not only does the season exert its influence over the time of flowering of certain plants, but the nature of the soil also seems to modify it. The *Ranunculus bulbosus*, when growing in meadows, is usually in bloom about May, or if the season be later, in the earlier part of June. I believe that in cultivated ground it would often be found in bloom later in the autumn, when not a plant would be found in the meadows in bloom. If this prove cor-

rect in all cases, it may tend to throw additional light on the *causes* of plants being found in bloom at unusual periods.

In the last week in September, I was searching in this neighbourhood for *Ranunculus hirsutus*, which I had not hitherto found. On approaching a cultivated field at the back of Mortlake church, I observed that it was studded with the flowers of some species of *Ranunculus*, and I began to congratulate myself on the discovery of the plant I was searching for, but alas! it was too premature; it proved to be no other than *R. bulbosus*. It was a useful observation, however, to me, and I think it may prove so to the readers of the 'Phytologist,' whom it may induce to note similar observations, should they present themselves.

In a botanical excursion to Dorking on the 10th of October, I observed the common honeysuckle, (*Lonicera Periclymenum*, L.) in full bloom in many places.

THOMAS MEEHAM.

Kew, November 10, 1846.

On Fairy Rings. By J. FORD DAVIS, Esq.

IN writing to you about "Fairy Rings," it is not my intention to enter fully upon the scientific view of the subject with Wollaston and Way, or the more imaginative ones of your facetious correspondent O. P. and the credulous and superstitious Aubrey. I propose to state merely what has fallen under my own observation, during the course of many years, in the lawn before my residence in this city. The rings there are numerous, and so are the fungi, but I have never observed more than one species, viz. *Agaricus Orcades*. White mentions puff-balls, Wollaston *A. Orcades*, *campestris*, *terreus*, *procerus*, and *Lycoperdon bovista*. Way mentions only one, *A. graveolens*, growing in those around the college at Cirencester. But what has struck me as very remarkable, if not quite new (for I do not know that it has been noticed by any writer), is that the colour of the grass in the rings is not alone changed, but that the grasses themselves are changed; for the finer lawn grasses, with *Trifolium repens*, disappear in those upon our Crescent lawn, and Cock's-foot (*Dactylis glomerata*) takes their place.

Mr. Way has afforded us a probable explanation of increased fertility, but will that be sufficient to account for the substitution of a solitary, coarse, and darker coloured grass for several others of a finer and better quality? It may indeed be questioned whether the term

"increased fertility" be applicable to the case. Have we not then a right to conclude that Fairy Rings still remain, as Knapp said, an *opprobrium physiologicum*?

JOHN FORD DAVIS.

Royal Crescent, Bath,
November, 7th, 1846.

[OUR correspondent, who considers the theory of radiation *imaginative*, and our friend O. P., who considers it *new*, will be equally surprised to learn that M. Adrien de Jussieu, in his 'Botanique,' has completely forestalled O. Ps.' views, and published them as obvious and established truths. This theory is taught in the schools of France with the acknowledged *principia* of botanical education of which it now forms a part. M. Jussieu's observations are quoted at a subsequent page of the present number, and will be read with pleasure by those who take an interest in the subject.—EDITOR].

Notice of 'a Catalogue of the Phænogamous Plants and Ferns of Great Britain, arranged according to the natural orders; with a copious list of synonyms carefully compiled from Steudel's Nomenclator Botanicus, Smith's English Flora, Hooker's British Flora, Lindley's Synopsis, Babington's Manual, and other sources. By HENRY IBBOTSON.' Parts I and II. 1846. (To be completed in six Parts).

EACH successive author of an English Flora, whether with or without good reasons thereunto moving, invariably discards sundry old established names of plants, and substitutes other names in their stead. The reasons for such name-changing are various; sometimes good and sufficient; sometimes, it is to be regretted, neither good nor sufficient.

A change of name becomes proper and necessary, where any preceding author has incorrectly applied the name of some different species to the plant which really inhabits Britain; as, for example, in the case of *Crepis virens* being substituted for *Crepis tectorum* in recent works, and in the case of *Lepidium Smithii* being used instead of *Lepidium hirtum*. Equally proper and necessary is the introduction of a new name, in those instances where two of our native species have been confused together, and described under a single name; as in the case of *Oenanthe Phellandrium* and *Oenanthe fluviatilis*, or in

that of *Ranunculus hederaceus* and *Ranunculus Lenormandi*—assuming these to be couplets, respectively, of two good species.

But it is not proper, and is very unnecessary, to follow the example of those species-makers who so eagerly pounce upon any variety, howsoever trifling, which falls under their ken, and “raise it to the rank of a species.” Their course is thus:—All intermediate and connecting links are studiously left out of view, a specific character is concocted from the peculiarities observable in the extreme forms, a new name is invented, and the species is “made”—in words. So utterly indifferent to reality and truthfulness, are some of our great species-makers, that they will act similarly, although in possession of only solitary or imperfect specimens of the “new species.” And some of them will even coolly inform us (after the untenableness of their pretended species has been rendered too apparent for the longer continuance of them in books) that they were described for species simply in order “to draw attention to them.” As if the only or proper way of drawing attention to varieties, were that of designedly misleading other botanists, in the question of their specific distinctness or indistinctness, and of thus loading our books with unnecessary and troublesome synonyms.

In numerous instances, changes are made in the old-established generic names of plants, the specific names being retained; although, in nine cases out of ten, such generic changes are uncalled for, and really serve no purpose more useful than that of gratifying the personal vanity of the botanist who makes them. By thus coining a fresh generic name for the plant, the botanist is enabled to substitute also an abbreviation of his own surname, as the authority for the species, instead of that of the person who originally described the species. Thus by substituting the new generic name of “*Serrafalcus*,” in place of “*Bromus*,” a notoriety-seeking botanist was enabled to erect himself into the authority for some species of the latter newly made genus; and through this charge, the familiar “*Bromus mollis*, *Linn.*” becomes a “*Serrafalcus mollis*, *Parl.*” Even the simple adoption of these new generic names will frequently answer the same end; because they can still be applied to other species of the original genus, by him who only adopts the new generic name. By so doing, he also is enabled to substitute an abbreviation of his own surname as the authority for these other species, and to discard that of an earlier describer of the same plants. It is not wished to give offence to one of our best English botanists, in suggesting that the opportunity for substituting “*Serrafalcus secalinus*, *Bab.*” instead of “*Bromus secalinus*, *Linn.*”

may have *unconsciously* influenced the author of the 'Manual,' when adopting into that useful work the newly coined generic name from the conceited Parlatore.

The subdivision of one large genus into two or more genera, however, may be excusable and allowable, when founded upon clear and decided characters. Yet can it seldom be necessary, or even desirable, thus to multiply synonyms; since a subgeneric section would usually answer the *scientific* purposes fully as well,—though not ministering so satisfactorily to the personal vanity of the name-changer. Thus, the separation of *Luzula* from *Juncus*, of *Armeria* from *Statice*, being favoured by considerable diversity of general habit, as well as by fair enough technical characters, it was soon acquiesced in by botanists; as also that of *Linaria* from *Antirrhinum*, of *Pelargonium* from *Geranium*, made on conspicuous floral differences, although not accompanied with equally decided distinctions of habit. On the contrary, the separation of *Eleocharis* from *Scirpus* is bad; because the technical distinction, derived from a trifling peculiarity in the style, makes a most unnatural subdivision of the genus; half the species which correspond with *Eleocharis* in general habit, being still left in the genus *Scirpus*.

Some botanists will change also the specific name, together with the generic name of a plant, and thus interpose an additional obstacle in the way of identifying the synonyms as those of one single species. This course is necessary, indeed, when a species is removed from one genus into another, and becomes associated under the same generic name with another species already bearing the same specific name; otherwise we should have two species with the same names, both generic and specific. And when two or more genera are united, the one discarded generic name is occasionally taken up for a specific name; as in the instance of *Potentilla Tormentilla*.

We have premised these remarks on name-changing, as exceptional cases where the recognized rule of priority will not enable botanists to select the right name of a species. By itself, that rule is simply a matter of date or time, and its application is usually easy and certain. The true difficulties of nomenclature arise from the vexed questions touching the limits between species and varieties, and from diversities of opinion respecting the characters which are to be deemed sufficient or insufficient for the establishment of genera. These are not matters of date. They are points to be decided by the acquired knowledge and sound judgment of botanists; and as individuals differ most widely from each other in such mental qualities,

their decisions will also differ. In general, those botanists who are endowed with brains of small size, and in whom the observing organs predominate over the reasoning organs, will be found great dividers of species and genera ; because they inherit from nature a tendency to small ideas and to minutely close observation. On the other hand, those botanists who carry brains of large size, and in whom the reasoning predominate over the observing organs, often incline to the opposite extreme, and would too far combine genera and alleged species; such persons having a natural disinclination to minute observation and petty distinctions. Each party, from their mental constitution, believe themselves right. Ultimately, the decision is made by authority or majority.

Be the grounds for name-changing what they may, sound or unsound, error or the correction of error, truth-seeking or personal vanity,—the load of synonyms has gradually accumulated into “a great fact” in our botanical literature ; and is one so troublesome to all botanists, so perplexing to the student, that tables of synonyms become indispensable to the working botanist, whether learner or learned, who requires to use the publications of several different authors. Of the necessity of such compilations of names, under existing circumstances, there can be no doubt. Their usefulness to botanists will depend upon their accuracy and completeness, and upon the facility with which they can be referred to.

With respect to facility of reference, although there may be some convenience in a systematic arrangement of the species, the alphabetical series of names and synonyms appears by far the most useful form. Tables of synonyms are essentially *Dictionaries*, by means of which we may be enabled to find other words or names corresponding with any given one. And universal experience shows that the alphabetical series of words is the best and most convenient in all kinds of dictionaries. Accordingly, Stendel has made his great work, the ‘*Nomenclator Botanicus*,’ an alphabetical one.

Secondly, with respect to completeness and accuracy, the importance of these merits is too obvious to require argument or illustration. Under the most favourable circumstances, a general *Nomenclator* may be expected to contain many errors and omissions. The most careful compiler may himself commit them, through imperfect acquaintance with the species or with the works from which he quotes ; while the most complete knowledge of plants and books, ever acquired by an individual botanist, must still leave him unprepared to detect and correct all the misnomers of other writers. In short, a general

Nomenclator ought to be the work of a first-rate botanist ; and all the knowledge which such a botanist could bring to the task, would still fail to render his undertaking perfectly complete and free from error.

A local Nomenclator, or one restricted to the plants of a single country, differs only in extent from the general one. There should still be equal facility in use and reference ; and we might fairly expect a greater degree of completeness and freedom from error, within its much narrower scope. We cannot, indeed, say that only a first-rate general botanist should undertake this much more limited work. But we may still say that its author ought to possess a first-rate knowledge of the plants of the single country, and that he should be familiarly acquainted with the works in which they are described, or in which their habitats are recorded. Without such full knowledge and familiarity, he would be unable correctly to identify the synonyms, and to rectify the misnomers of other authors. The compiler of a local Nomenclator ought to be qualified to supply the omissions and to correct the errors of a general Nomenclator, such as that of Steudel, so far as the species and the authors of his own single country are concerned.

Allowing this view to be sound, it would have required a Wilson or a Leighton, a Borrer or a Babington, to have executed such a compilation of synonyms properly, and to have made it critically accurate and complete. Our surprise, therefore, was great to find the task undertaken by Mr. Ibbotson. We believe this gentleman to be a botanist of good abilities, possessing a considerable knowledge of English plants, and to be very useful in his own familiar sphere of action. Still, we cannot regard him as rising to the same level with those whom we should deem fairly qualified for the special task which he has thus undertaken ; namely, compiling a local Nomenclator, or Catalogue of British plants *and their synonyms*. With so many Floras and Catalogues already before the public, it is doubtless a very easy task to copy out or compile a list of British plants. But to make a critical compilation of synonyms, even were it restricted to those of British authors only, would be no facile task ; and the labour is vastly augmented by including the synonyms of foreign botanists also.

Mr. Ibbotson's work is simply a list of British plants, arranged according to the natural method, with numerous synonyms printed in a smaller type, underneath the names of the species to which they belong, or are supposed to do so by Mr. Ibbotson. No distinction is made between native and naturalised species ; nor even between those which have been erroneously reported as British and those which are

really so. The names of all are printed uniformly, and they are numbered consecutively ; as if all the names belonged to species which are equally and certainly British. In these respects, the Catalogue is a retrogression towards the inferior models, which were in use some years ago, and which have been improved upon in the more recent Floras and Catalogues. Mr. Ibbotson's work is, in truth, a very incorrect list of British plants ; or rather, it is a list of species which have been reported as British, rightly or falsely, without distinction.

We could have wished to find these defects of the Catalogue, while regarded as a list of species, compensated by some peculiar excellence or usefulness in the compilation of the synonyms. For the most part, however, they are copied wholesale from Steudel's Nomenclator, without critical selection, apparently without verification, and with very few of those additions and corrections from the works of English authors, which might so reasonably have been expected in a list of names exclusively restricted to the plants of this country. In short, the lists of synonyms are rather plagiarisms from the Nomenclator of Steudel, than fair compilations ; or, should that term appear too harsh, let us say *reprints* from the Nomenclator. In the additions made by Mr. Ibbotson himself, we fail to detect any regular plan or rule of selection, which can account for the few additions and many omissions. But two or three examples will best illustrate and establish the grounds of our censures and objections to this work.

As the Catalogue issues from a provincial press, it may have been slowly printed ; and we will therefore not hold the author blameable for the omission of *Ranunculus Lenormandi*, *Cerastium strictum*, or other names which should have come in the earlier pages of the work. But when we turn to the latter portion of part II. (only two parts having yet reached us, and both being dated in 1846), and still find errors and omissions which might have been avoided by ordinary care in consulting standard or familiar works, we must think the Catalogue to be deserving of serious censure.

In example of omissions which should certainly not have occurred in any "carefully compiled" list of synonyms of British plants, for the use of British botanists, we will refer to "*Crepis virens*, *Lin.*" of the Catalogue. The native species, to which this name is applied, was published under that of *Hedypnoides tectorum* in the 'Flora Anglica,' and under that of *Crepis tectorum* in the 'Flora Britannica,' 'English Botany,' 'English Flora,' &c. Nevertheless we do not find the *Hedypnois tectorum* or *Crepis tectorum*, of any British author, given among the synonyms of *C. virens*. A dozen other synonyms are given ; but

these are merely transcribed from Steudel's *Nomenclator*, without change or addition. For anything that appears in Mr. Ibbotson's Catalogue, all English authors may have used the name of *Crepis virens* only and constantly.

A similar omission occurs under "*Barkhausia taraxacifolia*, *Dec.*" Repeatedly as this plant has been published under the name of *Crepis biennis*, by English botanists, we do not find any English author quoted for this synonym. As far as the Catalogue goes, no such misnomer may have ever occurred in this country.

Some of the author's own errors,—not of omission, but of commission—seem quite unaccountable. Thus, for example, the "*Hypochæris maculata*, *Sm. E. B.*" is placed as a synonym of the stained-leaf variety of *Hieracium murorum*, to which Mr. Samuel Gibson gave the name of *Hieracium hypochæroides* (*Phytol.* i. 741, 802, &c). And this odd mistake becomes still more odd, when we see the name of the same species, "*Hypochæris maculata*, *Lin.*," also quoted as a synonym of "*Achyrophorus maculatus*, *Scop.*," and rightly so quoted.

The *Hieracium pulmonarium*, of Smith, is still entered as two species; first, under name of "*nigrescens*," and, secondly, under that of "*pulmonarium*;" under this latter name, being made the typical form of *Hieracium diaphanum* of Fries. This is doubtless copied from Babington's Manual; and had not the fact of specific identity, between the two alleged species, been subsequently made public in the pages of the '*Phytologist*' (*Phytol.* ii. 442 and 496), we should have held Mr. Ibbotson quite excused for merely continuing a mistake, which had formerly arisen from an imperfect knowledge of the plant intended under those names. At first, we had thought that the excuse of date might sufficiently account for the repetition of this inaccuracy; but on the same sheet of the Catalogue we find the name of *Vaccinium macrocarpum*, a species which was first published, as British, on the very same leaf of the '*Phytologist*,' on which the identity of *Hieracium pulmonarium* and *nigrescens* was distinctly announced. This circumstance proves that the correction was within reach of Mr. Ibbotson, before he reprinted the error.

Still, this Catalogue may have its use. First, having the advantage of a date two years later, than that of the '*London Catalogue*,' it includes some few species and corrections which have been published within those two years. But against this small superiority we have to balance its price, which is (or, when complete, will be) twelve times that of the '*London Catalogue*.' Secondly and chiefly, it includes a reprint of Steudel's collection of synonyms, with some additions from

the works of English botanists. But for the use of those who study only British plants, a careful compilation of the synonyms of British authors, and even of these alone, would have proved more serviceable than this wholesale transcript from Steudel, of the synonyms of foreign authors *instead*.

C.

Notice of the 'London Journal of Botany,' Nos. 56 to 59, dated August to November, 1846.

(Continued from page 585).

No. 56. Contents: "New Hepaticæ;" by Thomas Taylor, M.D. "Botanical Information;" comprising a continuation of Mr. Richard Spruce's Notes on the Botany of the Pyrenees; also a continuation of Mr. Burke's Journal of travels in South Africa; with Boissier's Excursions in Spain. "Description of a New Genus of Compositæ and a New Species of Plantago, from the mountains of Tasmania;" by J. D. Hooker, M.D. "Remarks on the New Species of Musci from Quito and Swan River, indicated by Dr. Taylor;" by William Wilson, Esq.

No. 57. Contents: "Remarks on the New Species of Musci," &c., by William Wilson, Esq. "Contributions towards a Flora of Brazil, being the Characters of several New Species of Compositæ, belonging to the tribe Eupatoriaceæ;" by George Gardner, Esq. "Botanical Information;" being a journey, by Dr. Von Martius, from Oeiras to San Luis.

No. 58. Contents: "Botanical Information;" being a continuation of Dr. Martius' journey; also a continuation of Notes on the Missouri and Oregon Territories; by Charles A. Geyer; also Notes made during a Continental Tour, by an anonymous friend of the Editor; also Notice of three New Fungi, collected by Mr. Gardner in Ceylon; and a continuation of Mr. Spruce's Notes on the Botany of the Pyrenees. "Annotationes in Piperaceas Herbarii Arnottiani;" autore F. A. Miguel.

No. 59. Contents: "Revue de la Famille des Simaroubées;" par J. E. Planchon, Docteur-en-sciences. "Sur le genre Godoya et ses analogues, avec des Observations sur les limites des Ochnacées, et une Revue des genres et espèces de ce groupe;" par J. E. Planchon, Docteur-en-sciences. "Memoir of the Life of Dr. J. R. T. Vogel;"

by L. C. Treviranus—translated from the German in the *Linnaea*, by the Rev. M. J. Berkeley.

Readily will it be inferred from the titles of these articles, that they can have no particular interest in the eyes of those who devote their attention, principally or exclusively, to the Botany of our own islands. And, indeed, the miscellaneous, and often very inexact notes on plants, made during the time of journeying in foreign lands, can afford interest to very few general botanists; while isolated descriptions of new genera and species, and “reviews of families,” important though they may be with relation to the progress of science, can still interest but a small section of the botanical world. We are mostly content, therefore, to indicate by their titles, to the readers of the ‘*Phytologist*,’ that such papers have been published, and can be seen by those who require to see them. But some few extracts, culled from the tours and travels, may instruct or amuse our readers.

The Editor’s anonymous friend, dating from Stockholm, thus alludes to the Linnean relics, preserved in London :—“We went with Professor Fries to see the house in which *Linnaeus* lived, and the garden where he cultivated his ‘*Hort. Upsal.*’ plants, now no longer belonging to the family; but in which the buildings used by this great father of modern Botany, as green houses and lecture-room, still exist; and a poplar-tree, known to be planted by his own hands, is shown with great reverence. Proud though we be in England of possessing his collections, it is impossible to be at *Upsala*, where so much is associated with his name, to see the respect paid to his memory, and the value attached to the few manuscripts or other remembrances of him which they have been able to amass, without feeling that this is the place where his library and herbarium ought to be, and that if they had been here, the botanical world would long since have known what information can or cannot be derived from the specimens preserved, and as a tribute to his extraordinary genius, such of his manuscripts as are really interesting or curious, (and they are not a few), would have been given to the public, instead of lying unknown in the attics of our Linnean Society.” (No. 58, p. 259).

The same writer incidentally lets slip the following pointed remark in allusion to a bad custom which has so much increased of late. “It is a great pity that the great mass of matter (about thirty folio volumes) ready for his *Enumeration*, which *Vahl* left at his premature death, was never published. His descriptions are amongst the most accurate I know amongst descriptions of *species*, so much better than descrip-

tions of *individuals*, which botanists, accurate in minutiae, are so apt to give us." (No. 58, p. 526).

As a contrast to the habit of describing individuals for species, we will now copy a suggestion by Mr. Spruce, which may rather astonish some of the "species-splitters." Of *Aquilegia pyrenaica*, he observes, "I do not see how this is to be kept apart from *A. alpina*, for I find the spur always more or less curved at the extremity; and I consider it highly probable that both of them are merely alpine states of *A. vulgaris*." (No. 28, p. 537).

Tarry-at-home botanists, with every facility for drying specimens, often make heavy complaints against the condition in which those of distant countries are sent to us, and more especially those of intertropical lands. An extract from Vogel's notes may teach us to make some allowance for this frequently unavoidable defect. He writes, "I am very comfortable on board, except when my collections are lying about. When I return laden with plants, I have nowhere to prepare them; and when they are dry, the damp insinuates itself to such a degree, that I am compelled to re-dry them. This is very troublesome; and on board a ship, especially a man-of-war, there is no especial place for preparing or preserving plants. I am quite a nuisance to my messmates when I unpack them; and so is the servant who announces breakfast, lunch, &c., for the table must be cleared. I must be off, and then I try to work on deck; but there the wind and rain attack me, so that I have to contend with all the elements." Again, he says, "I regret very much that I have so many difficulties to overcome, in reference to my collections, from the scanty room on shipboard, and the humidity of the weather. If not attended to daily, everything is covered with mould, and even the paper in the chest becomes quite damp. Perhaps, after much pains, I am so fortunate as to get my plants dry, with the help of the sun and steam-engine; but I have still to look to them again, and often find cause enough for repeating the process. Notwithstanding all this trouble, the specimens are bad, they fall to pieces and mould continually; and I must sit down under the sorry consolation, that I have effected with all my zeal as much as circumstances will allow." (No. 59, pp. 605 and 610).

C.

BOTANICAL SOCIETY OF LONDON.

Nov. 6th, 1846. — J. E. Gray, Esq, F.R.S., &c., President, in the Chair.

The following donations were announced : 50 specimens of *Caruus setosus* and some specimens of *Luzula nivea*, presented by Dr. Dewar, 50 specimens of *Galium Vaillantii*, presented by Mr. G. S. Gibson, 90 specimens of *Sisyrinchium anceps*, presented by Mr. J. Lynam, 60 specimens of *Glyceria plicata*, presented by Mr. T. Moore. Upwards of 300 specimens of *Spartina alterniflora* collected at Itchen Ferry, Southampton, in September last, by Mr. Hewett Watson and Mr. G. E. Dennes. The Reverend A. Bloxam presented a copy of his Fasciculus of British *Rubi*. Some thousands of specimens of Azoric plants had been received from T. C. Hunt, Esq., Her Majesty's Consul at St. Michael's. This was in continuation of Mr. H.'s former series of specimens sent to the Society. A large parcel of Pyrenean specimens had also been received from Dr. Southby.

British plants had been received from Mr. H. Taylor, Mr. A. J. Hambrough, Mr. F. Barham, Mr. J. Ansell, Mr. B. Eddison, Mr. T. Ingall and Mr. J. H. Wilson.

Donations to the Library were announced from Mr. Hewett Watson, Dr. Beck, and Mr. W. Pamplin.

The following papers were read.

"On *Hieracium maculatum* (Smith), by Mr. James Bladon (Phytol. ii. 683).

"On the Potato disease, by Mr. Moberly.—G. E. D.

The System of Nature, as displayed in the Vegetable Kingdom.
By EDWARD NEWMAN.

WHEN a man feels convinced that he has published new and important truths, he cannot reasonably be required to keep silence respecting them ; it does not argue a lack of modesty that he should desire to see those truths known and appreciated. I do not at all participate in the feelings of authors, who profess to write for another and a wiser generation : I wish those whom I know by reputation or by familiar intercourse, or with whom I am united in the bond of brotherhood and good feeling, or who, like myself, love truth for its own great and glorious sake, I wish these to enter on the inquiry, to examine

what I have written, to condemn what is erroneous, and to cherish, and acknowledge, and propagate what is true. Entertaining these views, I make no apology for introducing my ideas of the System of Nature to the readers of the 'Phytologist.'

The present era in botanical science is marked by the severity with which methods have been analyzed and tested: we seem to have arrived at a period when nothing that is old and faulty can stand. The sexual method of Linneus is an instance of this; nothing could be more ingenious, more obvious, more triumphant, or at the same time more artificial. Day by day it is losing ground as a method, although the services of its details can never be dispensed with. Every system of organs, every series of functions, is now rigidly investigated, and the microscope is perpetually called in, to render the result more complete. Now it is very desirable to bear in mind that the views I promulged respecting System as regards the Animal Kingdom, are mainly dependant on the laborious researches of Cuvier, Geoffroy St. Hilaire, and Owen: without the dissecting knife and microscope, without the rigid investigations of the anatomists, no human efforts could ever reach the truth: and so in the Vegetable Kingdom, it is the patient and laborious physiologist who must supply the clew to the true system.

Whatever may be said of the respective merits of the methods of Linneus and Jussieu, I believe the feeling is universal, that these methods owe their merits entirely to their respective authors. The terms *natural* and *artificial*, erroneously applied to them, has misled many superficial writers, and some have even been stolid enough to assert that Linneus, in speaking of a natural system, made a prophetic allusion to the method of Jussieu.

I shall take no pains to enforce the existence of a *really* natural system: it is to me so self-evident a fact, that I waive the inquiry as altogether superfluous. And assuming this, I also deny to man the power of erecting one. Thus supposing a Ray, a Jussieu or a De Candolle to excel in the perception of character, and, by great discrimination, to succeed in forming a series in which species shall follow each other in what appears orderly succession: the great merit of these philosophers still consists in having, by means of their knowledge and discrimination, obtained some idea, more or less precise as the case may be, of that universal scheme which is preexistent to human knowledge and independent of human genius. Thus by a strange inversion of what we are too apt to consider retributive justice, the more nearly human intellect can attain to the enunciation of Nature's laws as regards system, the further it recedes from that ardently

sought for notoriety which is the concomitant of human conceptions, and is nicely apportioned in degree to their respective brilliancy.

My own ideas of system have been fully explained as regards the Animal Kingdom; but as far as my information extends, no attempt has even been made to test the applicability of the same laws to the vegetable world. I do not pretend that I am in a situation to do this, but I think enough is now known of the Vegetable Kingdom to show the extreme probability, the almost certainty of the applicability of the same laws in grouping both animals and vegetables. The history of physical science exhibits a tendency to subdivide large and conspicuous forms, rather than small or obscure forms. This tendency spreads itself like an impenetrable fog over the works of our earlier naturalists, but becomes gradually dissipated by the advance of knowledge. And here perhaps I may be allowed to venture a criticism on Linnean classification. It was the failing of this great man to leave the more imperfect individuals of every group, without sufficient investigation, and hence to institute groups bearing the same title, but of most unequal value. In this respect, Jussieu was infinitely superior: who that has the slightest idea of equivalents in natural history, will not at once admit that Monandria or Diandria or Triandria, is no equivalent to the class Cryptogamia, while the Vasculares and Cellulares of Jussieu are as justly balanced as the Vertebrata and Invertebrata of Lamarck: in saying this I do not assert that either of these divisions is unexceptionable, but they are intelligible, and indicate comprehensive ideas in those who defined them. The value of equivalents has yet to be acknowledged, but acknowledged it must be before we can make one safe step towards the discovery of the System of Nature.

In the Animal Kingdom, the great and simple division suggested by Lamarck of Vertebrata and Invertebrata is perfectly truthful, which is the highest attribute of all, but is it final? Can we show that the Invertebrata does not contain several groups equal to the whole of the Vertebrata? Can we not, on the contrary, show that it does contain such groups? Are not the Articulata, Molluscata, and Radiata, as regards primary difference in structure, nearly as isolated as the Vertebrata themselves? The use of the negative *in* is intensely deceptive: we can scarcely resist grasping at so plausible a division as vertebrate and *invertebrate*, but if we reflect that a division into radiate and *inradiate* possesses in an equal degree the merit of a positive and negative, we shall pause, before allowing too great weight to such a mode of division.

It was left for the master mind of a Cuvier to divide the Animal Kingdom into four provinces, all of them distinguished by *positive* characters only; and although several attempts have subsequently been made to alter and amend these provinces, they are so based on real structural character as to meet with universal acceptance: these provinces are Vertebrata, Mollusca, Articulata and Radiata. Now without pausing to investigate the methods which have succeeded the binary or dichotomous division of vegetables, let us pass at once to the most recent and most extensively known classification of the Vegetable Kingdom; I allude to that by Professor Lindley: we shall there find four vast comprehensive classes called Exogens, Endogens, Thallogens and Acrogens, and we shall find no botanist expressing a doubt as to the *naturalness* of each of these. They include nearly the whole of the Vegetable Kingdom; but Professor Lindley has separated three minor groups, and given them a standing equal to the four comprehensive classes, *i. e.*, he has called all of them *classes*. The three minor classes are Rhizogens, constructed for the reception of the Rafflesiaceæ, &c.; Dictyogens, comprising *Tamus*, Paris, &c.; Gymnogens, including the pines, the yew, the juniper. Without attempting to influence the reader in his judgment of the distinctness of these minor classes, the almost immeasurable superiority of the major classes as regards the number of species they contain, is sufficient to warrant our giving them precedence in an inquiry like the present. We have thus four primary divisions in each kingdom: in animals, Vertebrates, Articulates, Molluscates and Radiates; in plants, Exogens, Endogens, Acrogens and Thallogens: each of the two kingdoms, in fine, possesses what Cuvier has called four "general plans after which the individuals appear to have been modelled."

Having thus shown that a numerical correspondence exists between the primary divisions of the two kingdoms, the next task is to exhibit a correspondence between the classes themselves, *i. e.*, to show that each of the four divisions of the Vegetable Kingdom corresponds with a division of the Animal Kingdom. The idea of the existence of parallels between the divisions of the two kingdoms is of a very early date, and more recently M. Virey has laid great stress on these parallels, and has shown a very marked correspondence between the two kingdoms. At present I have only to touch on this subject as necessary to the development of the System of Nature.

The analogy existing between the exogens among plants and the vertebrates among animals, seems too obvious to require comment:

neither will any instructed naturalist express a doubt as to the analogy between endogens and articulates. These analogies have been so fully established by more able pens than mine, that I could not attempt to adduce new proofs without obvious impertinence, neither could I retrace the steps of my predecessors without needless repetition. The case is however somewhat different in what are called the lower classes, for we have until lately been taught to combine under the name of acrogens, two totally dissimilar and distinct classes : one of these, acrogens is composed of the ferns, Lycopodia and mosses ; the other, thallogens, of the Fungi, Lichens and Algæ. Now the thallogens are very evidently analogous to the radiates, many of them display all the peculiarities of the radiate structure, and in those instances in which the radiation from a centre is lost, analogues occur in the corresponding group from which this peculiarity is also absent. It must however be observed that our knowledge of both classes is yet in its infancy. Concerning the more conspicuous thallogens, the agarics, an opinion has just been broached that they are merely the flower of a subterranean plant,* and concerning one of our most interesting zoophytal radiates, *Photocrinus europæus*, it has been discovered by Mr. J. V. Thompson, that its head, or armed disk, at a certain period of its existence, becomes detached, and thenceforth wanders free as *Comatula rosacea*. The question must occur to every reflecting mind,—Are we to consider the *Photocrinus* or the *Comatula* the type for comparison ? Is the spawn or the mushroom the perfect plant ? These questions are not to be answered hastily. How little do we yet know of the laws which regulate the reproduction of species ! It was long a received opinion, that an animal or a plant repro-

* After describing the hymenium, the pileus, &c., A. de Jussieu says, "The parts just described do not, however, constitute the whole of the fungus : they are, in fact, in a certain sense, nothing more than its inflorescence. Before this is developed, we see a number of filaments, radiating from a common centre (which centre is probably a spore in a state of germination), and intersecting each other in all directions ; they subsequently become entangled and thickened at certain points, at which are formed the organs previously described. This filamentous net-work is named the *mycelium* ; it is generally concealed below the surface of the ground, and escapes observation as well by its situation as by its fragile texture : it is not however unfrequently developed in damp and dark places ; as, for instance, on wood in our cellars. This mycelium is a sort of subterranean tree, which exposes to the light only the extremities of its branches, furnished with the organs of reproduction, so that in general, all the fungi which we observe growing in communities, belong in reality but to a single individual ; hence arises the circular disposition so frequently affected by them, the mycelium being regularly developed in the centre, and sending its rays to equal distances from that centre."—*Botanique*, par Adrien de Jussieu : p. 549.

duces its own likeness, but more careful observation has shown that this is far from being uniformly the case, or in other words, that the law of reproduction is irregular unless it be in undetermined cycles. Every one knows that the entomologist has laid down a law for the reproduction of insects; he tells us that each individual commences life as an egg, then becomes a larva, then a pupa, and lastly an imago; but, the little insignificant plant-louse refuses these conditions, and mounts upwards *one* step with *one* or *several* generations; thus the egg *becomes* a larva, the larva *produces* a larva, this larva a pupa, and the pupa becomes an imago. In the 'Entomological Magazine' for April, 1833, was published the astounding and then incredible fact that the hop-fly was sometimes born with wings.* But this discovery sinks into insignificance compared with observations lately published by a German naturalist, on some of the more obscure tribes of radiate animals. This author asserts that certain forms which have long been considered perfect animals, and have been ranged in our methods under other fixed technical names, are absolutely the parents or progenitors of certain other animals, which are also ranged in our methods under other fixed technical names: and it seems that these *nurses* may succeed each other, as in the Aphides, for many generations. In introducing this brief notice of Steenstrup's work, I do not wish to be understood as adopting his views; all I can venture to say is, that his observations appear to have been made with patience and care, and his deductions drawn with perfect candour and fair reasoning, so that his work is entitled to our respect. Seeing, then, how difficult it is to fix on states that shall exactly correspond, a comparison of the radiates and thallogens must be made from a general, rather than an individual, similarity: and we shall find in their equivocal mode of reproduction, in the obscurity, if not absence of sexes, in the simplicity of their structure, and in their general tendency to radiation from a centre, that there is a general similarity between these two primary divisions.

The acrogens, restricted to the ferns, mosses, &c., are supposed by systematists to be the analogues of the mollusks, including the Annelides; and as in the thallogens, so in the acrogens, we have great difficulty in fixing the portion of the plant which shall be the subject of comparison. The frond of a fern has been called a branch, a leaf, and a flower; but the general plan seems to be to treat the fronds, taken collectively, as the entire plant: now if this view be correct, I confess that there is but slender hope of establishing any analogy between a fern and a great yellow slug, or any of the slug tribe. But let us pause

* Ent. Mag., i. 315.

before we allow the frond of a fern greater importance in the economy of the plant than it really possesses. Three years ago I attempted to introduce *Polypodium vulgare* on a wall at Peckham, the fronds withered and fell, but now, since the recent rains in October, and long after I supposed the plant dead, two fronds have appeared, and though small, they will probably live through the winter: thus it will appear evident, not only that the fronds are not *the* plant, but that *the* plant can exist for two years without their assistance. I therefore incline to regard the rhizoma as *the* plant in *Polypodium vulgare*, and its fronds as respiratory and reproductive appendages, which, when their office is performed, wither and fall, without injury to the plant which bears them: this idea will I think receive additional confirmation from an attentive examination of the bulky rhizoma of *Davallia Canariensis*. Now if this bulky rhizoma is *the* plant, as the slug is certainly *the* animal, it is the limaciform rhizoma, and not the beautifully divided frond of the *Davallia*, that we must compare with the slug: the same may be said of *Polypodium* and *Trichomanes*: their vermiform rhizomata may fairly be compared with Annelides, without any extraordinary strain on the inventive faculties. Pursuing this subject still further, we shall find that many limaciform nudibranchiate mollusks throw out, as respiratory organs, beautifully branched fronds resembling those of ferns.* In reproduction there is also a correspondence: mollusks are hermaphrodite, each individual is productive, and ferns produce seed without the apparent presence of stamens, or anything to which can be assigned a similar office; so that the sexes are mixed, and not distinct as in the vertebrates and exogens, and the articulates and endogens. I believe the more the subject is investigated, the more strict will be found the analogy between mollusks among animals, and acrogens among vegetables.

We thus arrive at the following parallel

Plans of Structure.

In the ANIMAL KINGDOM.		In the VEGETABLE KINGDOM.
Vertebrate	=	Exogen
Articulate	=	Endogen
Molluscate	=	Acrogen
Radiate	=	Thallogen

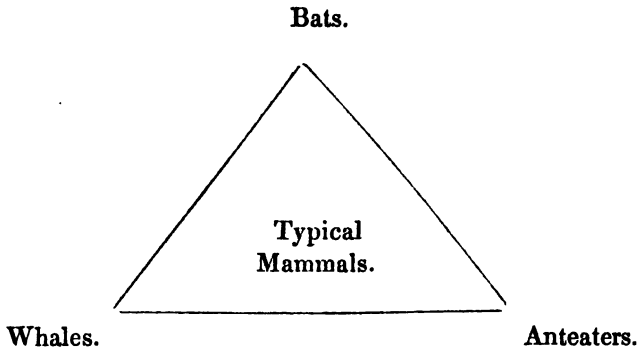
The next proposition relates to the position of these divisions.

I have taken great pains to show that the four divisions of the Ani-

* *Tritonia arborescens* of Cuvier is a remarkable instance of this; it has seven or eight pairs of these branchial fronds, those towards the head being the largest and those nearest the tail the smallest: the anterior pairs are beautifully divided and subdivided, like the fronds of *Davallia*.

mal Kingdom cannot be made to follow each other in a linear series, because each of the divisions, articulates, mollusks and radiates, contains more highly organised animals than some that must necessarily be placed in both the others: moreover, the first division, vertebrates, contains animals which seem to typify or indicate respectively the articulate, mollusk and radiate plans of structure. As I am aware that many of my readers are not zoologists, I will select a more strikingly obvious example of this typification or indication. The superior group among Vertebrata contains the four well-known classes, called Mammals, Birds, Reptiles and Fishes. All but the first of these are peculiarly well marked: a child, before he can speak plainly, knows a bird, a reptile, and a fish from each other: the mammals form a group which all naturalists agree in considering of higher rank than either of the others, and as a concomitant of this superiority, there should be found among them animals which respectively indicate, typify, or represent, birds, reptiles and fishes; and this is strictly the case: among mammals we find birds indicated in the bats; reptiles in the armadilloes and anteaters; and fishes in the whales and dolphins. The uninstructed mind at once sees the force of this representation; it even contends that a bat *is* a bird, that an armadillo *is* a reptile, and that a whale *is* a fish. This is going too far: we may fairly consider them the representatives of these classes, but not as belonging to them. Bats, whales, and armadilloes agree in possessing warm blood, in being truly viviparous, and in suckling their young: it is therefore impossible to disjoin them from typical mammals, such as the ordinary quadrupeds, although the bats adopt the flight of a bird, together with possession of many important similarities of structure; although armadilloes and anteaters have the alimentary canal, the reptant gait, the dermal armature of reptiles; and although the dolphins and whales have the figure, the fins, and the habits of fishes. Now, supposing the mammals grouped on a level surface, the most perfect or typical occupying the centre of the group, then we shall find a variety of forms, which indicate, more or less obviously, an approach to one or other of the three aberrant forms, namely bats, anteaters and whales, and we shall find that these three forms differ from each other as widely as it is possible for animals to do, which must necessarily be regarded as part of the same superior group: so that abandoning all idea of a linear series, which, indeed, it is impossible to construct, and supposing the Mammalia standing on the superficies of any figure, a triangle for instance, and all arranged strictly in accordance with their degrees of resemblance to the most perfect or typical, which occupies the centre,

then must the bats, anteaters and whales occupy the angles; for we can not otherwise express their dissimilarity *inter se* and their departure from the type. The subjoined figure expresses this.



The contents of the group called mammals being thus expressed, not for any hypothetical end, but because their difference from the typical forms and from each other *cannot be otherwise expressed*, it remains only to arrange the great classes of birds, reptiles and fishes, in places which common sense will at once assign them, as under.

BIRDS.

Bats.

MAMMALS.

Whales.

Anteaters.

FISHES.

REPTILES.

As I have said before, the Vertebrata have been selected rather than the entire Animal Kingdom, because their divisions are more obvious to those who do not happen to have made structural Zoology their particular study: those who have studied this science, will see that the same formula of arrangement obtains in the primary divisions, and that they range thus:—

ARTICULATES.

VERTEBRATES.

RADIATES.

MOLLUSCATES.

Lest a question be asked, "What fixes the relative position of Articulata, Molluscata and Radiata?" it may be as well to observe that this cannot be altered; place Molluscata or Radiata at the top, and the *relative* position of the four groups, will still be exactly as shown above.

It is now necessary to show a correspondence between this formula of arrangement and that which obtains in the Vegetable Kingdom: the four primary groups of vegetables are placed in a corresponding position below.

ENDOGENS.

EXOGENS.

THALLOGENS.

ACROGENS.

This formula, it will doubtless be observed, is only hypothetical at present, but a little further investigation will remove this impression, and show that it is real. And here it is necessary to go back to the three diminutive groups which have already been noticed as having been lately proposed by Professor Lindley: these are Dictyogens, Gymnogens, and Rhizogens, all of which I am willing to take as they are, *viz.*, certain plants which like bats, anteaters and whales, present structural peculiarities which render it difficult to class them with either of the larger groups. It is quite foreign to my purpose to claim for them the title of Classes, Alliances or Orders; it is sufficient that a botanist of Mr. Lindley's eminence has considered it necessary to separate them from the rest.

Dictyogens, as will be seen by turning to the paper (Phytol ii. 561) to which I have before alluded, are separated from endogens, because the leaves are "net-veined and deciduous," and because the root has its wood arranged "in a solid concentric circle." Still the plants of this group are monocotyledonous, and are said to have the "wood of their stems arranged in a confused manner with the youngest in the centre." As far as I am aware, these conditions are accepted by all botanists, although Mr. Lindley is the only one who has thought them sufficiently important for the foundation of a new division. Well then, it follows that these plants combine the *essential* characters of exogens with some of the more obvious and usually distinctive characters of endogens, so that we must either consider them a separate class, as Mr. Lindley has done, or endogenoid exogens, or exogenoid endogens.

One of these courses we *must* adopt, and I am content with either, for either will fix their station between the typical endogens and the typical exogens, and will show that these great classes lead into each other.

The class Gymnogens, in prior works by the same author, is made to combine the pines, the equisetums and some other groups, but in the present publication the equisetums are omitted, and carried over the boundary which has hitherto separated them from acrogens, a group in which they are generally included by other authors. The plants in this class are separated from the other exogens by the character, "seeds quite naked." The facial or superficial approach of the pines to the extinct Calamites, of these again to equisetums and tree-ferns, is obvious to all; much might also be said of the peculiar wood of the Coniferæ, which has lately attracted so much attention, and has shown how this group recedes from the true exogenous structure, and approaches the acrogenous structure of the ferns, without displaying, as far as I can detect, a similar approach to the structure of the endogens, so that by means of the gymnogens, whether we consider them a distinct class or not, we must pass from the exogens to the acrogens without the intervention of the commonly interposed class of endogens.

"At this point of the Vegetable Kingdom," says Mr. Lindley, "there is a plain transition from the highest form of organization to the lowest. Gymnogens are essentially exogens in all that appertains to their organs of vegetation; they have concentric zones in their wood, a vascular system, in which spiral vessels are found, and a central pith; but they are analogous to reptiles in the Animal Kingdom, inasmuch as their ova are fertilized by direct contact with the male principle. The two most remarkable of the orders are conifers and cycads. Of these, the former is connected with club-mosses among acrogens by means of the extinct genus, *Lepidodendron*, and their branches are sometimes so similar to those of certain lycopods

* "Among endogens no difference has been remarked in the mode of propagation, but a material peculiarity has been noticed in the manner of growth. In the great mass of the class the stem and root are formed in a similar way, or there is no considerable difference between them, and the leaves have no articulation with the stem; but in a part of them the root is exactly like that of an exogen without concentric circles, and the leaves fall off the stem by a clean fracture, just as in that class. Such fundamental distinctions have given rise to the separation by me of endogens into — 1. *Endogens* proper, and 2. *Dictyogens*."—*Lindley, Veg. Kingd.* 4.

The above is correctly quoted, but the statement that the root is "*without concentric circles*" of woody matter is evidently a misprint. *G. L.*

themselves, as to leave no doubt of their relation. Compare, for instance, *Lycopodium Phlegmaria* and *Cunninghamia siamensis*. Some cycads have the gyrate veneration of the leaves of true ferns, along with the inflorescence of conifers; and their mode of forming their trunk, although essentially the same as that of exogens, yet resembles the growth of acrogens in lengthening by a terminal bud only.

While, however, the class of gymnogens is thus distinctly marked by the most important physiological peculiarities, it approaches the highest forms of vegetation by that portion of it which bears the name of joint-firs, plants with all the structure of their class, but with the manner of growth of chloranth and beef-woods."—*L. V. K.* 221.*

The Rhizogens are a peculiar tribe, and have become intimately known to botanists through the descriptions of Robert Brown and the inimitable figures of Bauer, published in the "Transactions of the Linnean Society of London." It will be sufficient to mention the remarkable genus *Rafflesia* as the type of this class, in order to place the class itself fully before the mind of a botanist. Mr. Lindley characterises the rhizogens as flowering, sexual plants, whose fructification springs from a thallus. Notwithstanding the labours of Robert Brown we are still in ignorance of many essential characters of these plants: we see nothing more than a huge, fleshy flower, sessile on the root or rhizoma of some other vegetable; there is no stem, leaf, or root; the vast expanded flower is all that we can see. Many botanists have considered it phænogamous, others cryptogamous. The substance on which it grows must receive further investigation, the nature of its connexion with the flower is a point of the greatest interest:—Mr. Lindley's idea of its affinities is conveyed in this passage. "At this point of the Vegetable Kingdom we find a most curious assemblage, which, with many of the peculiarities of endogens, seem to be an intermediate form of organization between them and thallogens.

* "Among exogens there are, however, two totally different modes in which the influence of the pollen is communicated to the seed. The larger part of this great class consists of plants provided with the apparatus called style and stigma, through which pollen-tubes are introduced into the ovary during the act of fertilization. But others are so constructed that the pollen falls immediately upon the ovules, without the introduction of any intermediate apparatus; a peculiarity analogous to what occurs among reptiles in the Animal Kingdom: and, as was to have been anticipated, the plants in which this singular habit occurs prove, upon being collected together, to form a group having no direct affinity with those among which they had been previously associated. Hence exogens have been broken up into,—1. Exogens proper, or those having an ovary, style, and stigma; and 2. Gymnogens, which have neither."—*Lindley, Veg. Kingd.* 4.

They have no relation to-acrogens, but they agree with endogens in the presence of sexes and sometimes in the ternary structure of their flower; they have however scarcely any spiral vessels, and their seeds appear, as far as they have been examined, either as some say, to want the cotyledons and axis of other flowering plants, or to lose themselves in a mass of pulp from which they are almost indistinguishable. In their amorphous succulent texture, in their color, often in their putrid odour when decaying, in the formation of a mycelium or spawn, which is evident in Helosis and is with good reason suspected to exist in others, and in their parasitical habits, these plants resemble fungals, while in their flowers and sexes they accord with Arumworts or similar endogens."—*L. V.K.* 83.

It appears to me very clear that Mr Lindley is mistaken in supposing any points of correspondence between the flowers of of the rhizogens and those of Arumworts, except such general correspondence as exists between all flowers. I could wish this learned botanist had pointed out a single point of accordance not equally applicable to all the phænogamous plants. I confess my own conviction that there are but two of the primary classes with which the rhizogens can be associated: if not in reality constituting a separate class, as Mr. Lindley supposes, they must be either fungoid exogens, or phanerogamous fungi. They partake of the characters of each class so strongly, so decidedly, that should further investigations prove them to be fungi, they must necessarily occupy the very margin of the group of thallogens, and precisely at the spot where it most nearly approaches the group of exogens. On the other hand, should they prove to be exogens, then, certain decidedly fungoid characters must lead us to place them at the extreme margin of the group of exogens, where these approach the thallogens.

From these observations the following formula results.

ENDOGENS.

DICTYOGENS.

EXOGENS.

RHIZOGENS.

GYMNOGENS.

THALLOGENS.

ACROGENS.

Now this is exactly the formula that I have already shown to obtain in the Animal Kingdom; and so convinced do I feel of its truth that I look forward to the result of every investigation into the detail of structure, as certain to furnish corroborative evidence. I am unprepared to pursue the subject further than this, which may be termed the mere threshold of the enquiry; but sincerely do I hope that others who are better botanists and better logicians than myself will not allow the question to rest; sincerely do I hope that there are those amongst my readers who may not pin their faith on the merits of a method however ingenious, merely because it happens to be invented by a Ray, a Linneus, a Jussieu, a DeCandollé or a Lindley; but consider whether there be not a system-maker far above these. And let me ask them whether it be not a worthier occupation diligently to work out the details of that system which has existed from the beginning, than to cavil about the merits of methods, the value of which depends solely on the degree of assistance they may render us in working out the "System of Nature." EDWARD NEWMAN.

Supplementary Note. By Mr. GEORGE LUXFORD, A.L.S., F.B.S.E.,
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HAVING lately reviewed the subject of Rhizogens, as well as the materials at my command will allow, I may venture to declare my opinion that they must be regarded as an offshoot of *Exogens*, in opposition to Lindley's supposition that they are *Endogens*, with which I must confess I previously agreed; but supposing them to be Endogenous, there would be a manifest want of a connecting link between Exogens and Thallogens, equivalent to the very evident transition from Exogens and Acrogens afforded by the Gymnogens, and the equally strong connexion between Exogens and Endogens, exhibited by Dictyogens.

Before the nature of the rhizogens was so well understood as it now is, they were by some botanists considered to be altogether of a fungoid character. That they do actually partake, in a certain degree, of the character of thallogens, there seems to be but little doubt; but it is also certain that their strong affinity with phænogamous plants is equally well established. They possess a distinct sexual apparatus, more or less modified indeed, and in some genera of very anomalous character, but apparently never so changed as that the male and female organs cannot be readily distinguished. The anthers, in some, open by slits, in others by pores; their pollen has

been well observed; and in *Cytinus* R. Brown has traced the pollen-tubes through the tissue of the style, into the ovarium, "where they follow the direction of the placentæ, and become mixed with the ovula." The female flowers of all possess an unmistakeable ovarium, furnished with placentæ, to which the ovules are attached, each by its funiculus: and the seeds, so far as they have been examined, are found to have an embryo. In all these particulars the rhizogens evidently agree with flowering, and differ from flowerless plants: while the amorphous, fungoid character of their organs of vegetation as clearly evince their relationship with the Cellulares.

It is more difficult to make out their affinity as regards Exogens or Endogens. In this part of the inquiry their organs of vegetation afford us no assistance, since these organs clearly point out their relationship with another division of the Vegetable Kingdom. The almost normal structure of some parts of their organs of reproduction, however, indicate the quarter in which we must seek information. The quaternary or quinary arrangement of the floral envelopes, in the majority of species, accords with the law obtaining in Exogens. The condition of the embryo is a particular not so easily investigated, and from the minuteness of that organ, as well, perhaps, as from its not being in a sufficiently advanced stage of development when examined, it is difficult to decide whether it be divided or not. Bauer and Brown seem to be of opinion that the embryo is undivided; but Lindley, in speaking of the seed of *Cynomorium coccineum*, says, "On one side of this seed is a globular embryo, looking like a speck, but found, when properly examined, to be a globose mass of cells, destitute of starch, inclosed within the albumen, and apparently undivided on any part of its surface. It is, however, difficult to speak positively upon this point, on account of its smallness, and *I am not sure that it is not very slightly 2-lobed.*" But after all, the division or non-division of the embryo, though in the more highly developed plants of very great value, as indicative of accompanying peculiarities of structure, in many of the humbler members of the Vegetable Kingdom seems really to be of minor importance, since in some avowedly exogenous genera, as the Monotropaceæ, the embryo is undivided, while some as undoubtedly endogenous plants possess a divided embryo; and R. Brown says "an embryo of exactly the same kind [as that of Rafflesiaceæ and Balanophoreæ] exists in *Orobanche*, and other, perhaps all other, genera parasitic on roots." Indeed, when true leaves are altogether absent, or are so deficient in development as they are in such plants as Rafflesiaceæ, Oro-

banchaceæ and Monotropaceæ, we need not be surprised at the absence or slight development of cotyledons in the embryo. In the exogenous Cuscutaceæ, too, the species of which are wholly destitute of leaves, the embryo is spiral, filiform, and perfectly acotyledonous. Moreover, R. Brown evidently considers the Rafflesiaceæ and their allies to be unquestionably related to the Aristolochiaceæ, which are exogens; although this great botanist is as evidently inclined to disallow their claims to be looked upon as forming a distinct class. But there are so many anomalies connected with their development and mode of growth, and those anomalies seem all to point to the normal mode of increase by means of a mycelium or thallus, observed in the best understood fungoid members of the class of thallogens, that I cannot but agree with Professor Lindley in believing that the rhizogens do really form a distinct class, the several members of which are as intimately related among themselves by numerous unmistakable peculiarities, as by these very peculiarities they are separated from the other classes, and naturally located as a connecting link between the exogens and thallogens.

In one part of his second paper on *Rafflesia* in the 'Linnean Transactions,' Dr. Brown thus speaks of what has ever been a puzzling question in connexion with the economy of all entophytal parasites:—

"I may here advert to one of the most difficult points in the economy of Rafflesiaceæ, namely, by what means their minute embryos, which are at the same time of an extremely loose texture, are enabled to penetrate through the bark of the plants on which they vegetate, so as to account for such appearances as those exhibited in the nascent *Rafflesia Arnoldi* represented in [its second stage], in which I have been unable to trace any perceptible communication with the surface, and where the parasite seems rather to grow out of than into the stock."*

Now it is this very circumstance which I look upon as affording one of the strongest evidences of the fungoid nature of the organs of vegetation among rhizogens. It is precisely in accordance with the economy of entophytal thallogens, and equally opposed to all we know of that of parasitical phænogamous plants. By whatever means the spores of entophytal fungi obtain access to the interior of plants, we see nothing of the fungi until they are ready to *flower*, if I

* I have described these figures in connexion with Dr. Brown's remarks on the reticulate base of *Rafflesia* (Phytol. ii. 714).

may use the term. Their vegetative functions go on unseen within the substance of the plant infested by them, until the time arrives for the performance of one grand object of their existence, the propagation of their kind; the organs of reproduction then break through the epidermis of the infected plant, just in the same way as the young flower-buds of *Rafflesia* penetrate the cortical layers of the vine: the spores of the parasite being perfected, are at length dispersed, and having found a fitting nidus, a new generation goes through the same round of operations as those which characterized the career of its parent.

But in most cases of parasitism among the phænogamous plants, the parasites seem invariably to act on their victims from without inwards, that is, having fixed themselves on the external part, their radicles gradually penetrate the tissue of the internal portion to a greater or less depth. This is equally the case with *Viscum* and *Loranthus*, the seeds of which germinate on the bark of trees to which they have previously been firmly attached by means of their own viscid coating, and with *Cuscuta*, whose seeds in the first place germinate in the soil; the young *Cuscuta* subsequently attaches itself to its nurse by means of suckers, and then the root perishes. Other phænogamous root-parasites also first attack the exterior of roots. Mr. Bowman has clearly explained in the 'Linnean Transactions' the mode in which the young *Lathræa* attaches itself to the roots of hasel and ash; and Schlaüter states, in the 'Annales des Sciences,' that when *Orobanche* attacks *Picris hieracioides*, the seeds attach themselves to the points of the roots of the latter, which swell, and form a base for the parasite. I am inclined to believe that this is also the case with at least one British species, *Orobanche minor*; for in all cases where I have endeavoured to trace the connexion between this parasite and the roots of the clover, I have invariably found the former located near the termination of the fibrous roots of the latter: and Vaucher states that the seeds of *Orobanche ramosa* do not sprout unless they come in contact with the roots of hemp, and that they will even lie inert in the earth for years, except they meet with their proper nidus.

Notwithstanding this apparent difference in the mode in which the rhizogens and other parasites obtain access to the internal parts of the plants on which they vegetate, they all seem to agree in the depth to which they penetrate in search of nutriment. In *Cuscuta*, *Lathræa*, *Viscum* and *Loranthus*, the suckers stop at the first layer of completely formed wood, and judging from the figures of *Rafflesia* in

the 'Linnean Transactions,' the base of that plant descends no lower in the roots and stems of the vine on which it grows. The same thing is also represented by Blume in the figures of *Rafflesia* and *Brugmansia* in his 'Flora Javæ,' and by Mr. Griffith in the figures of his *Sapria* in the 'Linnean Transactions.' Indeed, this we might expect would be the case, since the proper juices of the plants which nourish the parasites, abound only in the outermost layers of new wood.

This seems the proper place to introduce some remarks by Mr. Brown, with regard to the organs of vegetation of the rhizogens, and the nature of their connexion with the stock.

"Connected with this point a question may also arise, whether the earliest effort of the seed after its deposition in the proper nidus, by whatever means this is effected, may not consist in the formation of a cellular tissue extending laterally under the bark of the stock and capable of producing the fully developed parasite.

"This question might not occur in regard to *Rafflesia* and *Brugmansia*, in both of which the individual plants are in general sufficiently distant on the root of the *Vitis* to make it probable that each developed parasite is produced from a distinct seed. But in *Pilosyles*, and even *Cytinus*, where they are closely approximated, their possible origin from one common basis or thallus is more readily suggested, especially on considering that in the former genus, which is dioecious, each group of parasites is generally, perhaps always, exclusively of one sex; and that these groups, often of great density, not unfrequently surround completely the branch of the stock. But although this view did occur to me as not very improbable, and as tending to remove some of the apparent difficulties, I have never been able to trace any substance decidedly distinct from the proper tissue of the stock: there are, however, some appearances favouring the hypothesis in both genera, especially in *Pilosyles*, but which require careful examination in the living plants."—*Linn. Trans.* xix. 232.

And further, on the nature of the connexion of the *Rafflesiaceæ* with what Dr. Brown calls "the reticulate base," he says,—

"This I ventured to consider a production of an intermediate kind, or rather as one derived from the stock or root of the vine, but excited and determined in its form and nature by the specific stimulus of the parasite. I expected, therefore, to find it existing in the form of a covering to the bractæ in the early state, as in *Cytinus*. This point has been fully confirmed, and is well shown in Mr. Bauer's drawings of the very young buds." These figures represent four buds of the

parasite, in different stages of development, penetrating the cortical layers of a branch (not root) of a vine.* That they proceed from the interior of the branch, is evident from the place of the youngest bud being merely indicated by a slight swelling, without any rupture of the bark. In the third stage the parasitical bud has burst the outer cortical layer of the branch, and appears entirely inclosed in a reticulated covering: while in the fourth the reticulated covering itself has burst, and discloses the external floral envelopes of the parasite. In reference to this reticulated envelope, Dr. Brown makes the remark in a foot-note, "That the whole of this covering belongs to the stock, is proved by its containing those raphides or acicular crystals which are so abundant in the root of the *Vitis* or *Cissus*, and which are altogether wanting in the parasite." This will be hereafter referred to.

It is with considerable diffidence that I am induced to express, however imperfectly, my reasons for looking upon these curious plants as forming a distinct class, especially as in so doing I am presuming to set up my own views in opposition to those of such able botanists as Dr. Brown and Mr. Griffith, who have both possessed greater advantages in studying the plants themselves, than I can ever hope to enjoy. I can, however, truly affirm that I have not jumped hastily at my conclusions, and in forming them I have been mainly assisted by the evidence furnished in the published labours of the above-named gentlemen. I am also happy to find that my views as to the distinctness of rhizogens as a class agree with the opinion of Dr. Lindley, who, in his last great work, 'the Vegetable Kingdom,' in raising them to that rank, appears to have done so on purely philosophical principles, and I think defends this step in such a way as to meet Mr. Griffith's most serious objections.

"The first office," says Dr. Lindley, "which all organized beings have to perform is that of feeding; for it is thus only that their existence is maintained. The second is that of propagating, by means of which their species is perpetuated. These being functions of the highest importance, it is reasonable to conclude that the organs provided for their proper execution must be of the highest importance also, and hence they are beyond all others valuable for the purposes of classification. And, again, because the power of feeding must come before that of propagating, it might be conjectured beforehand that the organs destined for the former operation would afford the first elements of a natural method. But since the action of feeding is

* This has been determined by Mr. Jack to be the *Cissus angustifolia* of Roxburgh.

very simple in the Vegetable Kingdom, because of the similar modes of life observable among plants, while, on the contrary, the act of propagation is highly diversified, on account of the very varied nature or structure of the parts by which it is accomplished; so might we conjecture that the organs of nutrition would afford but few distinctions available for purposes of classification, while those of fructification would furnish many. And such is the fact. Hence it is, that the great classes of plants are principally distinguished by their organs of growth, and that in the numerous minor groups such peculiarities are comparatively disregarded, their chief distinctions being derived from their parts of reproduction.”—*L. V. K.* xxvi.

And again, according to his axioms :—

“1. Peculiarities of structure which are connected with the manner in which a plant is developed are *physiological*; those which are connected with the manner in which parts are arranged are *structural*. Physiological characters are of two kinds, viz., those which are connected with the *mode of growth* (*the organs of vegetation*), and those which regulate *reproduction* (*the organs of fructification*). Physiological characters are of greater importance in regulating the natural classification of plants than structural.

“3. The internal or anatomical structure of the axis, and of the foliage, is of more importance than any other character; because these are the circumstances which essentially regulate the functions of growth and the very existence of an individual.”—*Ib.*

Now, examining the rhizogens by these axioms, we will endeavour to ascertain how far Mr. Griffith’s objections to them as a class are well founded. He declares that “in the construction of the group called Rhizanthææ, whatever its rank may be, a remarkable diversity of characters has been sacrificed to an appearance resulting from parasitism on roots, and to an assumed absence of any ordinary form of vegetable embryo.”—(*Linn. Trans.* xix. 303). But these objections surely fall to the ground, when we consider, first, the far more strongly marked diversity of character exhibited by plants composing the other classes of the Vegetable Kingdom; and secondly, the evident affinity existing among the true rhizogens, with regard to their habit and structure. For instance, what can possibly be more unlike, in nearly every character, among endogens, than the towering, highly developed, terrestrial palms, and the minute, simple, aquatic duck-weeds? And yet, they are both placed, not only in the same class, but in the same division of that class, notwithstanding that in the one we find the lowest, and in the other the highest degree of structural

development among endogenous plants. Again, take the independent, sturdy oak, with its roots spreading far and wide in search of nutriment, and its hundreds of rings of annual growth, connected with the central system by means of the medullary rays; compare this with many of its less developed associates among the exogens, the parasitic *Clandestina*, for example, in the stem of which neither medullary rays nor medullary sheath have been found, and whose nutriment is derived from the juices elaborated by other plants, by means of its own insidious roots. Nothing has yet been observed among the rhizogens so utterly opposed to all our notions of structural affinity as these opposite examples display; and yet the class has been objected to on the ground that "a remarkable diversity of characters has been sacrificed to an appearance resulting from parasitism." But in this very parasitism there is more real agreement than there is between the various modes in which plants included in other classes procure their nutriment; and if, as appears to have been done by Mr. Griffith himself, attempts have been made to thrust into the class plants which really differ from it in every essential character, the fault lies, not with the class, but with those who attribute to it discrepancies from which it is entirely free.

And first with regard to the parasitism of the rhizogens. This, Mr. Griffith says, "can only be said to be constant in its effects, which are similar to those observed to occur (almost) constantly in all phænogamous plants which are parasitic on roots;" and he refers to four different modes of parasitism observable in the plants which he considers to have been included in this class, viz.: 1. That exhibited by *Rafflesia*, *Sapria* and *Cytinus*: 2. That of *Balanophora* and *Phæocordylis*: 3. That of his own genus *Thismia*: and 4. That "said to occur in *Pilostyles*." Commencing with the group *Rafflesiaceæ*, we will remind our readers of the mode of development exhibited by *Rafflesia*, as figured by Bauer, and previously described (*Phytol.* ii. 715). This plant is there clearly shown to penetrate the cortical layers of the vine, proceeding *from within outwards*; in this particular perfectly agreeing with the mode of growth of the entophytal fungi, and being directly opposed to that of parasitic phænogamous plants. In this mode of parasitism perfectly agree all the genera included in the order; namely *Rafflesia*, *Brugmansia*, Mr. Griffith's own genus *Sapria*, *Apodanthes* and *Pilostyles*: and with this is most probably combined another peculiarity; that is, the existence of a subcortical mycelium or thallus, forming, in fact, the vegetative organs of the parasites, from which are evolved the flowers or reproductive organs,

without the intervention of any stem or stalk. To the probability of this, Dr. Brown thus alludes: "Connected with this point a question may also arise, whether the earliest effort of the seed after its deposition in the proper nidus, by whatever means this is effected, may not consist in the formation of a cellular tissue extending laterally under the bark of the stock, and capable of producing the fully developed parasite." (*Linn. Trans.* xix. 232). The genus *Pilostylis*, expressly quoted by Dr. Brown as offering a mode of development with which he appears to consider both *Rafflesia* and *Brugmansia* coincide, Mr. Griffith would exclude altogether from the rhizogens, because of this peculiarity of growth.

Of the nature of the parasitism of the order *Cytinaceæ* I cannot feel so certain, though from the figures I am inclined to suppose it differs only in degree from that of the *Rafflesiaceæ*; the former plants are distinguished from the latter by the scaly stem which rises from what, doubtless, is a kind of mycelium, more highly developed than in the *Rafflesiaceæ*, and on this stem the reproductive organs are seated, instead of springing directly from the thallus, as in the *Rafflesiaceæ*. In this order Dr. Lindley places Mr. Griffith's genus *Thismia*, with a mark of doubt; but this genus appears rather to belong to some exogenous or endogenous order. That it is parasitical, there is hardly a doubt; though its parasitism would seem to be of a very different nature from that of any of the rhizogens, and its habit indicates a structure of a much higher order.

The parasitism of the *Balanophoraceæ* again appears to bring them near the lichens in their organs of vegetation; for the thallus from which the clusters of flowers spring bears a very strong resemblance to that of the crustaceous thallogens. But surely, Sparrman's *Sarcophyte* can have no business in the same order or class as such plants as *Scybalium* and *Cynomorium*.

On the nature of the organs of vegetation of the plants composing his order of rhizogens, Dr. Lindley has the following remarks:—

"In *Helosis* and *Langsdorffia* the rhizome, which is horizontal and branched, and which at intervals throws up perpendicular flowering stalks, is quite analogous to the spawn of fungals. In *Cynomorium*, *Scybalium* and *Balanophora* this part is wanting, and in its room the roots of these genera emit roundish deformed tubers collected in a circle upon the roots of other plants, and growing into [query *out of*] them by some unknown process. Blume says, 'that at the period of germination of *Balanophoreæ* there is produced from the roots of the fig on which they grow an intermediate body, of a fleshy

nature and intimately combined with its superficial woody layers, and that this intermediate body is penetrated by their spiral vessels which render it woody.' He moreover adds, that 'several seeds of *Balanophoræ* germinate on nearly the same points of the fig-root; hence this woody body, or luxuriant product of the juices that are sucked out, has generally an irregular form, and the plants proceeding from such tubers grow out in different directions, much in the same manner as the tubers of a potato generate their offsets; with this difference, however, that in a potato the eyes of the plant are in the circumference, while in *Balanophora* they are placed in the centre, and on that account the intermediate body where the offsets break out, has necessarily a conical extension.' Something of the same kind occurs in *Scybalium*, whose tubers are expanded in an irregular form about the root of some unknown tree, are fleshy, and composed even in the substance of the stalk of somewhat irregular cells and no spiral vessels."—*Lind. Veg. Kingd.* 84.

Mr. Griffith says "there is a wide difference, it appears to me, between the parasitism of *Sapria*, *Cytinus*, and very probably of *Rafflesia*, and that of *Balanophora* and *Phæocordylis*, which appears to me to be of a peculiar nature." Blume's observations quoted above, however, show a remarkable coincidence between the mode of growth of *Rafflesia* and *Balanophora*. What Mr. Brown calls the reticulated base of *Rafflesia*, he has ascertained to be, as he anticipated, "derived from the stock or root of the vine, but excited and determined in its form and nature by the specific stimulus of the parasite;" and respecting this part in *Balanophora*, he thus writes:—"In some of those that I have examined, especially two species of *Balanophora*, the nature of this connexion is such, as can only be explained on the supposition that the germinating seed of the parasite excites a specific action in the stock, the result of which is the formation of a structure, either wholly or in part, derived from the root, and adapted to the support and protection of the undeveloped parasite; analogous therefore to the production of galls by the puncture of insects:" (*Linn. Trans.* xiii. 227). Thus are the observations of Blume confirmed by one of the greatest botanists of the day, and at the same time is conclusive evidence afforded of the identity of the mode of parasitism obtaining in two genera, which by some botanists have been considered as having little in common; the only difference being that in *Rafflesia* but one plant is developed from each of these gall-like enlargements of the stock, while in *Balanophora* there are several.

In continuation of this subject I now follow up the quotation from Lindley.

"The genuine species of *Helosis* show on their rhizome roundish conical buds seated on a very short stalk, or altogether sessile, inclosing the rudiments of a future head within a very thin involucre, as a fungus within the volva; this latter after a time splits into three or more segments, and emits the flower-head enlarged and furnished with a stalk, which is altogether naked except at the base, where it is surrounded by the scale-like segments of the withering involucre. This is the most simple form of involucre, which in the other genera becomes more and more complicated, and finally runs into numerous series of imbricated scales, which clothe the stipes more or less completely. In those genera which grow upon the bark of the stems of trees, there are some diversities of structure in the organs of vegetation that are very remarkable. Blume tells us that *Rafflesia Patma* appears upon the creeping roots or stems of *Cissus scariosa* in the form of solitary or clustered hemispherical dilatations, which look like excrescences or expansions of the root. These excrescences are something of the nature of leaf-buds, consisting of layers of scales and a more solid centre. As the latter increase in size they burst through the wrapper by tearing it irregularly from the apex towards the base, and develope themselves in the form of numerous scales, at first flesh-coloured, then brownish, and finally deep purple, which surround the flowers. As soon as these parts are exposed, richly nourished as they are by the humid air that surrounds them, they grow with such rapidity, that it is reported that *Rafflesia*, which, when full-blown, is a yard across, and when unexpanded is as large as a middle-sized cabbage, only takes about three months for its complete development."—*L. V. K.* 84.

Remarks on the parasitism of the rhizogens might be indefinitely multiplied; I trust, however, that the above will sufficiently show that their mode of growth in the various genera agrees in kind and differs only in degree. I have not much doubt that this will be confirmed by further investigations and discoveries; and that consequently a conclusive answer will be afforded to Mr. Griffith's objection, that a diversity of characters has been "sacrificed to an appearance of parasitism on roots."

His second objection, referring to the "assumed absence of any ordinary form of vegetable embryo," need not detain us, since it is more than probable that extended observation will detect the embryo

in all the genera, as it has already determined the presence of spiral vessels even in those members of the class from which they were originally supposed to be absent. But this is a matter of small moment in regard to the unity of the class, since the peculiarities of the organs of growth among its members, in which they all seem to agree, are sufficient to separate them from the phænogamous classes, with which other peculiarities in the organs of reproduction indicate their affinity.

One of Mr. Griffith's objections to the rhizogens, as a class, he equally applies to gymnogens, viz., their inferiority in number of species to the "other three natural classes or subkingdoms," alluding to the exogens, endogens and acrogens (from which, when the paper was written, the thallogens had not been separated). The recently formed class, dictyogens, also agrees in this small number of species. But this objection, so far from tending to overthrow the claims of the rhizogens to a place as a separate class, ought, it seems to me, to lead to the full recognition of those claims, and at the same time, to the admission of the perfect applicability of Mr. Newman's views of system to the vegetable kingdom. According to Mr. Newman, as he has himself explained, the whole Animal Kingdom naturally divides into four primary and three secondary (or minor) groups. If really founded in Nature, equivalent groups ought to exist in the other kingdoms as well as in the Animal Kingdom; and we accordingly find these groups ready made to our hand, and apparently well defined, in Lindley's 'Vegetable Kingdom,' the latest and best work on botanical classification published in this country. No one will deny that the four primary groups are of higher value than the three minor groups; indeed, the inferiority of these latter, with respect to the number of species included in them and other particulars, is so generally understood, that this circumstance has even been used as an argument against their admission. But when we consider that Professor Lindley, without any reference whatever to Mr. Newman's mode of grouping, has seen the necessity of separating the gymnogens from the exogens, and the dictyogens from the endogens, and has, moreover, from the internal evidence afforded by the rhizogens, considered it necessary to retain that group entire, notwithstanding the objections which have been raised to such a course; we may, I think, safely allow that the formation of these three minor groups was not altogether an arbitrary proceeding, but that there is evidence of their being actually founded in Nature.

Moreover, by the position assigned to the minor groups in the formula at p. 710, we get rid of the difficulties which would be otherwise encountered in locating these groups so that their relative affinities might be clearly expressed. The rhizogens, for example, affording, as they do, a natural transition from the exogens to the thallogens, cannot be more naturally placed than they are in the formula at p. 710; which position dissipates Mr. Griffith's objection that Dr. Lindley has placed them "after or in Monocotyledones."

In conclusion, I cannot help expressing my opinion that the System developed by Mr. Newman offers fewer objections and seems more in accordance with all the requirements of a natural arrangement than any other with which I am acquainted. This is a most legitimate subject for discussion in the pages of the 'Phytologist;' for although I expect to see Mr. Newman's views entirely confirmed by every fresh discovery, yet I must confess that I am not so wedded to my own opinions on certain points as to suppose them proof against free and fair discussion. If no one better qualified should think it worth while to work out the minor details of classification in accordance with the System above propounded, I may, if ever I have leisure, attempt to do so. For the present, so alarmed do I feel at my own temerity in having broached my ideas on this intricate matter, that in taking leave of the subject, I may say with Macbeth, "Look on't again, I dare not."

GEORGE LUXFORD.

East Temple Chambers,
Whitefriars' St., November, 1846.

Occurrence of Carex digitata near Cheltenham.

By CHARLES PRENTICE, Esq.

I WISH to state that *Carex digitata* grows sparingly on the limestone ledges of Cleeve Hill, about four miles from Cheltenham, although it has been most unaccountably overlooked by Mr. Buckman in his local Flora of Cheltenham, which is, however, inaccurate in several places. I shall be very happy to communicate specimens as vouchers of my accuracy.

CHARLES PRENTICE.

1, Oxford Villas, Cheltenham.

On the occurrence of Juncus lamprocarpus in a Viviparous state.

By HENRY WEBB, Esq.

I HAVE the pleasure to send you by our mutual friend, Mr. Deane, a specimen of *Juncus lamprocarpus*, in a viviparous state, found by me in a field at Blechingly, Surrey. If it is the first time it has been so noticed, it will be of interest to the readers of the 'Phytologist.'

HENRY WEBB.

Park Hill, Clapham,
1 September, 1846.

Note on Anemone apennina. By W. AINLEY, Esq.

I AM sorry I can give you no corroboration of the locality mentioned page 650, vol. i. of the 'Phytologist,' for the *Anemone apennina*. I have sought the spot and neighbourhood, I may say diligently, without success, so that I fear the few specimens gathered had escaped from some garden, and especially as there is proof of a garden existing a short time ago in the immediate vicinity.

W. AINLEY.

Bingley, November 16, 1846.

Note on Achillea tanacetifolia. By W. L. NOTCUTT, Esq.

MAY I request the favour of a corner in next month's 'Phytologist' to correct an error in my paper which appeared in the number for this month. The plant there alluded to from Cromford moor proves not to be *Achillea serrata* at all, but a species new to the British Flora, *A. tanacetifolia*. For its discovery we are indebted to Mr. Hardy, who found it in another locality besides that already given. I ought to state that it is to Mr. Babington that I owe the correction of the error into which I had inadvertently fallen.

W. L. NOTCUTT.

Fakenham, November 13, 1846.

CORRIGENDA.

- P. 581. For J. Townsend, Esq. read *Frederick Townsend, Esq.*, and add the address, *Steepphill Castle*.
 P. 683. For Rev. George Lawson read *George Lawson, Esq.*, and for Picallo read *Pitcullo*.
 P. 698, line 4, for *Caruus* read *Carduus*.
 P. 711, line 13 from bottom, for *exogens and acrogens* read *exogens to acrogens*.

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